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What should we be worried about? Estimating bilateral illicit financial risk envelopes for major developed and developing economies

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Abstract

While recent years have seen mounting efforts to curtail illicit financial flows (IFFs), gauging the scale, location, and nature of IFFs remains a major methodological challenge. Here we introduce a new illicit financial *risk envelope* estimation approach that attempts to build on the strengths of existing illicit financial vulnerability assessment methodologies, while mitigating their weaknesses, and use this to estimate the composition and scale of illicit financial risks for 10 major developed and developing economies. By bringing together three new large-scale datasets of illicit financial and offshore investment networks, we are able to produce empirically calibrated estimates of relative as well as total illicit financial flow and stock risks, on a combined actor nationality and proximate bilateral international geographic basis, across the channels of trade, banking, and foreign direct as well as portfolio investment. The results suggest that there are major differences in the composition of illicit financial risks impacting developing as opposed to developed countries: with developing country risks centered on trade and FDI-round-tripping by local actors, while developed countries have a more complex pattern of risks largely centered on international banking and portfolio investment, and predominantly driven by foreign developing country actors. The results also indicate that the worldwide composition of illicit financial risks is likely heavily skewed towards actors from countries with weak rule of law on a nationality basis, and towards jurisdictions with high levels of financial secrecy on a proximate geographic basis. This suggests that ongoing efforts to boost financial transparency, in key areas such as beneficial ownership reporting, are likely to yield substantial benefits in the combatting of illicit financial activities.

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1. Introduction

Recent years have seen mounting efforts by governments as well as international organizations to curtail illicit financial flows (IFFs), which are linked to and facilitate harmful activities including organized crime, terrorism, and the evasion of sanctions as well as taxes (Baker 2005; Cobham and Jansky 2020; Collin 2020; Home Office 2025; Kar and Spanjers 2015; Reuter 2012; UNODC-UNCTAD 2020). Effectively gauging the scale, location, and nature of IFFs, however, remains a major methodological challenge, due largely to the basic characteristics associated with their illicit nature: namely their deliberate concealment and laundering. This is often facilitated by the routing of transactions and asset ownership through opaque intermediary jurisdictions which often fail to report even basic data on international investment and trading relationships. Complicating matters further is the fact that international investment and trade are more broadly distorted by similar types of convoluted and opaque structures, often created to facilitate "technically legal" strategies of tax avoidance. These structures and strategies may or may not be considered to be illicit depending on the particularities of their use and construction combined with the specific definition of IFF employed (Cobham and Jansky 2020; Garcia-Bernardo and Jansky 2024; Haberly and Wojcik 2022; Palan et al. 2010; Jansky and Palansky 2019; UNODC-UNCTAD 2020; Zucman 2013).

These empirical barriers to the direct estimation of IFFs—which generally increase in direct proportion to the concentration of illicit financial risks themselves—have encouraged the development of more indirect methods for gauging the vulnerability of particular jurisdictions and investment and trading pathways to illicit financial risks. These *IFF vulnerability* assessment approaches seek to bypass the empirical barriers to direct IFF measurement by modeling IFF risks as a function of known illicit financial risk factors, multiplied by the total scale of bilateral international trading and investment interactions (Garcia-Bernardo et al. 2020; Mekpor et al., 2025).

By partially breaking the dependence of illicit financial estimation on nonexistent high-quality empirical data, vulnerability assessment approaches are capable of generating much more comprehensive analyses of IFF risks than would otherwise be possible. This is particularly the case for the highest risk countries and trade and investment relationships, for which the least amount of data tends to exist. However, their limited direct grounding in empirical data is simultaneously an inherent weakness of existing IFF vulnerability assessment methodologies. The risk functions employed in these methodologies tend to be only loosely defined based on general risk factors identified in the illicit financial research literature, rather than being subjected to rigorous empirical calibration. Moreover, due to the level at which international trade and investment data is tabulated, the risk

functions used in existing illicit financial vulnerability assessments can typically only be parameterized based on proximate jurisdiction-level factors—such as, for example, financial secrecy regulatory environments. What they cannot effectively model are risks linked to the nationalities, and more broadly the identities of the underlying actors who drive international trade and investment in any particular situation. Additionally, while helping to illuminate the relative intensities of illicit financial risks, existing IFF vulnerability assessments shed little on the potential absolute monetary scale of these risks.

Here we introduce a new approach to non-tax-related illicit financial vulnerability assessment—which we dub the illicit financial *risk envelope* estimation approach—which attempts to build on the strengths of existing vulnerability assessment methodologies, while mitigating their weaknesses. As in other vulnerability assessment approaches, the methodology here does not seek to directly estimate illicit financial flows. It rather models illicit financial risks as a function of country-level and international bilateral regulatory, institutional, and trade and investment variables. However, in comparison to existing illicit financial vulnerability assessment approaches, it introduces multiple key improvements.

Firstly, by drawing on three newly created large-scale micro-datasets of illicit and offshore financial networks, the methodology introduced here is able to 1) greatly refine the empirical calibration of illicit financial risk functions, and 2) increase the dimensionality of the international trade and investment datasets to which these risk functions are applied, to estimate bilateral vulnerabilities on an actor nationality in addition to proximate geographic basis. This allows us to undertake a far more rigorously grounded as well as precisely targeted modeling of illicit financial vulnerabilities than has hitherto been possible. This takes into account the combined impact of institutional and political risks at the level of actor home countries, in addition to regulatory risks at the level of the jurisdictions that directly mediate international investment and trading relationships.

The illicit financial risk functions derived here are, as in other illicit financial vulnerability assessment approaches, defined on a relative risk intensity rather than an absolute illicit financial stock or flow size basis. As we show, however, it is possible to use these functions to numerically constrain maximum possible values of bilateral illicit financial stocks and flows, under multiple sensitivity analysis scenarios. The resulting illicit financial *risk envelope* analysis, in contrast to previous illicit financial vulnerability assessments, thus informs our understanding of the potential absolute scale of illicit financial stocks and flows—while at the same time continuing to sidestep the data availability barriers to the direct estimation of these stocks and flows.

In the following sections we describe this novel illicit financial risk envelope estimation approach, and use it to comprehensively assess bilateral international illicit financial stock

and flow risks—across trade, banking, and foreign direct as well as portfolio investment—for ten major developed and developing countries. As we show, the empirical modeling of non-tax international illicit financial risks, with the help of the novel micro-level datasets used here, reveals that these risks vary according to highly non-linear exponential risk functions. At a proximate geographic level, the intensity of illicit financial risks mediated through jurisdictions, in relation to total international investment and trade stocks and flows, is estimated to be more than an order of magnitude higher in jurisdictions with relatively high, as opposed to low, levels of financial secrecy. Meanwhile, at an actor nationality level, countries with relatively weak rule of law are estimated to have illicit financial risk intensities that are hundreds of times higher than countries with stronger rule of law. The extremely nonlinear nature of these functions means that illicit financial risks tend to be disproportionately dominated by relatively small numbers of particularly high-risk intermediary jurisdictions and actor home countries. As we show, moreover, it also implies relatively tight constraints on the maximum potential concentration of illicit financial activities in trade and investment ties between the lower-risk actor home countries and jurisdictions that dominate total world trade and investment volumes.

The remainder of this paper is divided into four sections. We first examine the existing literature on empirical illicit financial flow and vulnerability estimation, before introducing the illicit financial risk envelope methodology, and then using it to estimate bilateral non-tax illicit financial flow (IFF) and stock (IFS) risk envelopes for 10 major developed and developing countries. We conclude with a discussion of the implications of the results for illicit finance research and policymaking.

As we show, the illicit financial risk envelopes estimated by the methodology here, for major economies, tend to be more closely aligned with the conservative than the aggressive end of prior estimates of total international illicit financial activities—thus helping to constrain the maximum potential scale of these activities. The results also shed detailed light on the international pattern of illicit financial risks. They suggest that the composition of these risks tends to be quite different for developed and developing countries. Developing country illicit financial flow and stock risks tend to be dominated by trade-linked illicit flows and FDI "round-tripping" by local actors. Meanwhlie, developed countries show a more complex pattern of largely financial-sector-centered risks that are predominantly driven by foreign, and in particular developing country actors. The results also indicate that a relatively small number of countries and jurisdictions likely play a central role in driving illicit financial risks across all economies examined. A large proportion of trade-related illicit financial risks are found to be driven across most countries by actors from China and Russia—with several countries in Latin America, Africa and the Middle East also found to play a leading role in driving illicit financial risks for the

US and UK. Meanwhile, financial sector-mediated illicit stock and flow risks are found to be concentrated on a proximate geographic basis, for the countries examined here, in investment ties with the US, UK, and offshore financial centers—with the British Overseas Territories playing by far the most prominent role among the latter. These onshore and offshore financial center mediated risks are, moreover, often concentrated in portfolio investment, rather than in the banking and direct investment channels which have to date attracted the largest amount of attention in efforts to measure and police illicit financial activities.

The results here have important implications for international efforts to combat illicit financial activities. Most importantly, they show that the intensity of non-tax-related illicit financial risks is powerfully impacted by financial transparency in key domains such as beneficial ownership reporting, banking, and international information exchange—with the geography of illicit financial risks disproportionately centered on jurisdictions with high levels of financial secrecy. This, we argue, underscores the importance of reorienting the basic approach to combatting IFFs away from a narrow AML/CFT compliance paradigm, towards a more fundamental infrastructural enhancement of the transparency of the global financial system. This should include, crucially, not only parity of treatment between functionally interchangeable categories of investment structures (e.g. in relation to beneficial ownership reporting), but also the plugging of key gaps in the basic international trade and investment data needed to effectively identify and track illicit financial risks.

2. Assessing illicit financial risks

The concept of illicit financial flows has evolved substantially over the past two decades, from a loosely defined catch-all for various forms of cross-border financial misconduct, into an increasingly precise concept with growing institutional and academic attention. The most widely cited definition, proposed by Cobham and Janský (2020), describes IFFs as "cross-border flows, where either the illicit origin of capital or the illicit nature of transactions undertaken is deliberately obscured." This definition was subsequently adopted, with modifications, by the UNODC–UNCTAD Conceptual Framework for the Statistical Measurement of Illicit Financial Flows (UNODC–UNCTAD 2020), which established IFFs as "financial flows that are illicit in origin, transfer or use, that reflect an exchange of value and that cross country borders." The inclusion of IFFs as a target in the UN Sustainable Development Goals (SDG indicator 16.4.1) has further cemented the concept's centrality, as well as the importance of monitoring and measuring IFFs.

Existing approaches to estimating IFFs broadly fall into three categories: anomaly-based methods, forensic micro-studies, and risk or vulnerability assessment frameworks.[4] The most prominent group of methodologies attempt to infer illicit flows from statistical *anomalies* in recorded economic data—with the three most commonly used such approaches being the identification of discrepancies in international trade and balance of payments data respectively, and the use of gravity models to detect anomalies in international investment data. The former two approaches are based on the identification of discrepancies in mirror trade statistics, on the one hand—or in other words, the value of exports as reported by sending countries versus the corresponding import values reported by receiving countries—and the analysis of "net errors and omissions" in balance of payments statistics, on the other. These methodologies are frequently employed together, with the assumption for both being that discrepancies in trade and balance of payments data are the result of deliberate strategies of mis-declaration designed to shift value across borders (Cobham & Janský, 2020; Kar and Cartwright-Smith, 2015; Kar and Spanjers 2015; Ndikumana and Boyce 2008).

These approaches have the advantage of resting on (for the most part) universally available trade and balance of payments statistics, and have generated headline estimates suggesting that developing countries likely lose hundreds of billions of dollars annually through trade-related IFFs and capital flight. The Report of the High Level Panel on Illicit Financial Flows from Africa (African Union, 2021), for example, estimates that Africa loses in excess of US$50 billion annually. Meanwhile, Kar and Spanjers (2015) estimate cumulative developing world illicit financial flows at nearly $8 trillion between 2004 and 2013, with trade mis-invoicing estimated to account for more than 80% of these flows. However, trade mirror data and balance of payment discrepancy analyses also suffer from serious limitations. Most importantly, discrepancies in both types of data can arise from legitimate sources, e.g. differences in classification systems, CIF/FOB adjustments, re-exports, timing effects, an inability to distinguish short-term commercial credit from capital flight, and various types of innocent errors and omissions generally in the collection and compilation of data. As a result, the basic assumption that anomalies must represent illicit flows does not necessarily hold (see Brandt, 2023; Collin, 2020; Forstater, 2018).

An alternative anomaly detection-based strategy, which does not rest as heavily on assumptions regarding underlying official data quality and consistency, employs gravity modeling to identify "excess" financial flows or positions that cannot be explained by

[4] A comprehensive review of these approaches can be found in Brandt (2023) and, with a somewhat different emphasis, in Collin (2020).

standard economic, geographic, and other social and relational proximity factors (Delatte et al., 2022; Gullo & Montalbano, 2022). Walker (1999) pioneered the application of gravity frameworks to the detection of money laundering, with this approach being subsequently refined in work by Masciandaro et al. (2007). With respect to tax-motivated IFFs, Zucman (2013) examine anomalies in national international investment positions to estimate that 8 percent of global household financial wealth is held in tax havens, three-quarters of it unrecorded. Meanwhile, Tørsløv, Wier and Zucman (2023) extend this logic to the analysis corporate profit shifting, estimating that 36 per cent of multinational profits are shifted to low-tax jurisdictions globally.

Making anomaly-extraction-based methodologies particularly effective in the identification of *tax*-related flows and arbitrage strategies, is the fact that tax-related distortions are typically the largest overall component of international investment anomalies (see Cobham and Jansky 2020).[5] The flip side of this, however, is that anomaly-based approaches often struggle to isolate *non-tax* IFFs—such as those linked to corruption, organized crime, and sanctions evasion—as these are typically buried within larger tax-related anomaly signals.

One way of dealing with this problem is to abandon the use of macro-level trade and investment data altogether, and rather attempt to more directly map and analyze illicit financial activities through a *forensic micro-study* approach. At the heart of this is the construction and analysis of large-scale granular datasets of illicit financial networks. Haberly (2025) and Haberly, Garrod and Barrington (2024), for example, draw on and augment US sanctioned entity and Foreign Corrupt Practices Act (FCPA) datasets to provide a comprehensive picture of the organization and historical evolution of multiple types of US-targeted illicit financial networks—including those used in organized criminal money laundering, the facilitation of international corruption, and the evasion of US and allied sanctions. Similarly, Chang, Harrington and Rockmore (2023 & 2025) use leaked data from the Panama, Paradise, and Pandora papers to map the international financial networks used by Russian oligarchs and international political elites. Meanwhile, Andersen, Johannesen and Rijkers (2022) use Bank for International Settlements data on offshore deposits to demonstrate that aid disbursements to aid-dependent countries coincide with sharp increases in haven bank deposits—consistent with the elite capture and diversion of aid funds at an implied average leakage rate of around 7.5 per cent.

[5] Such tax-related international financial flows may or may not be considered "illicit", depending on the extent to which they are structured in a "technically legal" manner, and the scope of the definition of IFFs employed (see UNCTAD & UNODC 2020).

Such a forensic micro micro-study approach has also proven to be a useful augment to macro-level anomaly-based analyses of international tax-related illicit financial flows. Johannesen and Zucman (2014), for example, exploit a unique panel of bilateral Swiss banking data to show that the G20 tax haven crackdown of 2009, rather than repatriating offshore wealth, merely prompted its relocation to non-treaty jurisdictions. Meanwhile, Alstadsæter, Johannesen and Zucman (2019) match leaked offshore account records with Scandinavian administrative data to examine the distribution of tax evasion among high-income taxpayers.

This body of forensic micro-study-based evidence has been invaluable in establishing that various categories of illicit financial activity are real, quantitatively significant, and deeply embedded within the structure of global finance. It has also helped to reveal detailed as well as stylized features in the international architecture of different types of illicit financial networks. However, as a technique for comprehensively estimating non-tax IFF volumes, the forensic approach is limited by its inherent case-specificity: it studies particular channels, jurisdictions, and mechanisms in detail, but it cannot provide an overview of the broader macroeconomic picture.

The *IFF vulnerability assessment* approach has been developed in an attempt to provide such a comprehensive picture of overall illicit financial risks, while at the same time circumventing the data availability barriers constraining the quantitative measurement of IFFs themselves at an aggregate level. Instead of attempting to directly estimate the scale of IFFs, this approach seeks to comprehensively assess the relative concentration of illicit financial risks in particular bilateral international trade and investment relationships (Mekpor et al., 2025). The basic logic of this methodology straightforward: total trade and investment flows are multiplied by risk coefficients derived from observable indicators of the conditions which facilitate IFFs. These can include financial secrecy, regulatory quality, and institutional integrity. The Tax Justice Network's IFF Vulnerability Tracker (Garcia-Bernardo, 2020) represents the most prominent implementation of this approach. This uses bilateral data on banking, FDI, portfolio investment, and trade, weighted by the Financial Secrecy Index and Corporate Tax Haven Index scores of partner jurisdictions, to generate composite vulnerability measures across four economic channels.

The vulnerability assessment approach has significant practical advantages. It can be applied comprehensively across all major economic channels and country pairs; it is replicable and updatable as new data becomes available; and it generates results which are directly policy-relevant. In particular, it is able to identify the bilateral relationships and jurisdictions where IFF risks are most concentrated. These properties have made the vulnerability approach attractive to policymakers and international organisations, and it

has been adopted, in various forms, in both national risk assessments and in the UNCTAD–UNODC methodological guidelines for SDG indicator 16.4.1 (UNCTAD & UNODC, 2020).

At the same time, however, existing IFF vulnerability assessment methodologies have three substantial limitations: namely a lack of rigorous empirical calibration of risk functions, an inability to gauge the absolute scale as opposed to relative intensities of illicit financial risks, and a representation of these risks at only a proximate geographic as opposed to an actor nationality-level. Firstly, the functions used to derive IFF risk coefficients, while informed by prior empirical research on illicit finance, are usually defined in a mathematically arbitrary manner, without direct empirical calibration. This typically involves multiplying trade and investment volumes with various arbitrarily scaled indices (of e.g. financial secrecy, rule of law, etc.) without determining the real-world shape of the relevant risk sensitivity functions. What is critical here, from a further methodological improvement standpoint, is the need to not only empirically calibrate the slopes and intercepts of these risk functions, but to also determine whether the shape of these functions is linear as opposed to e.g. exponential—as well as whether these functions actually exist at all, in the real world. This is, in practice, difficult to achieve, as the empirical calibration of illicit financial risk functions is itself constrained by many of the same data availability problems which hinder the direct estimation of IFFs themselves.

The empirically uncalibrated nature of existing illicit financial vulnerability assessments means that their outputs are in many respects more qualitative than quantitative in nature. Such approaches are useful insofar as they enable a more comprehensive assessment of relative bilateral international illicit financial risks to be conducted than would otherwise be possible, even if the picture of the risks thereby painted is inherently rough and stylized in nature. What current illicit financial vulnerability assessment approaches cannot do, however, is rigorously shed light on the total scale of illicit financial activities.

The bilateral international trade and investment datasets to which illicit financial risk coefficients are applied, in existing vulnerability approaches, do allow for the placement of some very broad constraints on the potential scale of illicit flows. However, these trade and investment datasets have their own limitations which limit their effective use in this context. Most problematic, is the fact that they are typically defined on only a proximate international geographic basis, rather than on the basis of ultimate interactions between actors based in various countries. Given that more than half of all international investment, as well as a substantial portion of world trade, is recorded on a proximate geographic basis as either entering or leaving offshore intermediary jurisdictions, we have only a very limited ability to infer ultimate actor nationalities from currently available trade and investment data (Damgaard et al., 2024; Haberly 2024; Haberly and Lawrie 2026; Haberly and Wojcik

2022; Johannesen et al. 2020). From the standpoint of the estimation of some illicit financial risk factors, such as effect of financial secrecy in offshore jurisdictions themselves, this proximate geographic representation of international trade and investment is appropriate. However, it is problematic in relation to institutional and political risk factors (e.g. rule of law, corruption, etc.) that are more likely to operate at the level of actor home countries, than at the level of intermediary jurisdictions. More broadly, Damgaard et al. (2024) show that standard gravity models of international investment increase substantially in explanatory power when so-called "phantom," or in other words indirectly mediated FDI, is stripped out, and reallocated to ultimate investor countries.

The methodology introduced here seeks to simultaneously address all three of the above limitations of existing illicit financial vulnerability assessment approaches—i.e. the absence of empirical calibration for illicit financial risk functions, the inability to estimate the potential scale as opposed to only relative concentration of these risks, and the reliance on datasets of proximate rather than ultimate bilateral international trade and investment relationships. This is done by bridging the gap between macro-level bilateral international illicit financial vulnerability approaches, and forensic micro-study-based approaches, by drawing on three new large-scale micro-data-grounded datasets of international illicit financial and offshore investment networks.

The first two of these are datasets of known illicit international financial networks, constructed through the comprehensive analysis and coding of historical US international corruption case (FCPA) and sanctions documents (Haberly 2025; Haberly, Garrod and Barrington, 2024). These two datasets are used to support the empirical calibration of non-tax illicit financial risk functions, as defined on the basis of country regulatory (financial secrecy) and institutional and political (rule of law) risk factors. Meanwhile, the third dataset provides the first map of the world FDI network (for countries comprising 75% of world GDP) that is cross-disaggregated by both immediate counterparty jurisdiction and true ultimate investor nationality (see Haberly and Lawrie 2026). This dataset has been constructed through the comprehensive triangulation between official FDI data and Orbis micro-data, augmented with systematic manual researching of the ultimate beneficial ownership of 12,000 offshore-domiciled business groups, to determine their true nationality. This is used to estimate the nationality of the actors behind FDI, and other trade and investment flows and positions—thus making it possible to define a two-dimensional illicit financial risk function based on the intersection of a) actor nationality and b) proximate trade and investment geography.

By bringing these three new datasets together, we are able to dramatically improve not only the empirical calibration of illicit financial risk functions, but also the geographic targeting

of illicit financial risk assessments. As we show, these methodological enhancements change the basic character of the output generated by an illicit financial vulnerability assessment approach; transforming this from essentially qualitative general threat picture, into a much more quantitatively meaningful, even if still inherently uncertain, international risk map. Beyond simply representing relative illicit financial risk intensities, these allow for the placement of rough numerical constraints—or illicit financial *risk envelopes*—on the maximum potential total scale of illicit financial stocks and flows that could theoretically exist for any given self-consistently applied risk model. As we show, these illicit financial risk envelopes tend to fall towards the conservative end of IFF estimates derived by other methodologies, thereby lending substantive content to the envelope boundaries. At the same time, these risk envelope maps can be generated at a simultaneously more expansive and more precisely targeted level—with respect to both the structure of geographic relationships, and international trade and investment stock and flow types—than the methodologies used to derive prior IFF estimates.

3. The estimation of illicit financial risk envelopes

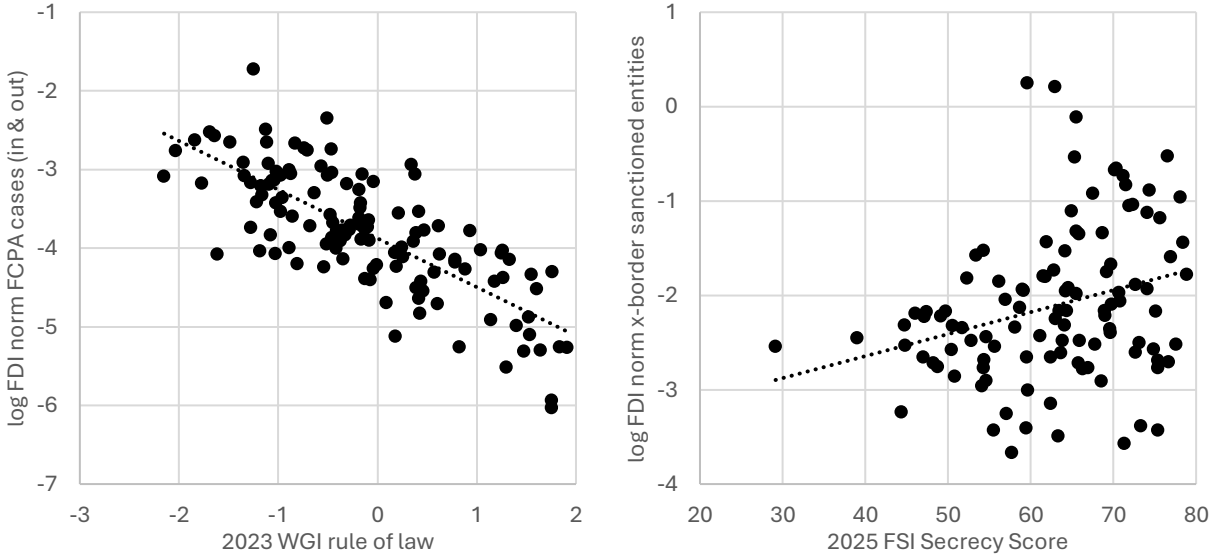
As in other illicit financial vulnerability assessment approaches, the methodology here estimates illicit financial risks as a function of total international trade and investment stocks and flows, multiplied by coefficients of illicit financial risk intensity—which are themselves calculated as functions of various risk factors. In contrast to existing illicit financial vulnerability approaches, however, we empirically estimate these illicit financial risk intensity functions, rather than defining them on a numerically arbitrary basis.

Crucially, while such an empirically-grounded risk function calibration approach affords greatly improved rigor, as compared to to existing illicit financial vulnerability approaches, it also carries with it a risk of overfitting to available calibration datasets, in ways that may not be broadly representative of illicit financial risks. To avoid this, we estimate an extremely simple illicit financial risk function. This assumes that illicit financial risks (as a percent of total trade and investment) can be defined, at a first-order level, as a function of a) financial secrecy in the two jurisdictions that are directly implicated in any particular trade and investment relationship on an immediate basis (taking the higher of the two secrecy values), and b) rule of law in the home countries of the actors undertaking trade and investment.

As described in section 2, we use two new large-scale datasets of documented international illicit financial networks to calibrate the two different components of this risk function. First, to estimate the sensitivity of illicit financial risks to financial secrecy, we use

the comprehensive dataset of US sanctioned illicit financial networks from Haberly (2025), which details the geographies, functions, users, international connections, and date of formation and sanctioning of over 9,000 entities. We specifically use the subset of 3,200 cross-border entities that are located in jurisdictions other the country of the underlying sanctioned actor to whom they are linked. As shown in Haberly (2025), nearly two thirds of these entities were sanctioned from 2020 onwards, thus providing a recent window into the geographies of multiple types of illicit financial network.

To construct the dependent variable of illicit financial risk intensity, for use in the proximate jurisdiction risk sensitivity calibration model, we normalize the total number of cross-border sanctioned entities, in each jurisdiction, by total inward FDI stock (2023). Meanwhile, for the independent variable, we use, as in other IFF vulnerability assessment studies (e.g. Garcia-Bernardo 2020), jurisdiction secrecy scores from the Tax Justice Network's most recent (2025) Financial Secrecy Index (FSI). As shown in figure 1 (right), the heteroskedastic distribution of the relationship between these two variables requires that the dependent variable (FDI normalized cross-border sanctioned entities hosted) be log-transformed—thus implying an exponential, rather than a linear impact, of financial secrecy on illicit financial risk intensity. We use a simple OLS model to estimate this risk function. As shown in table 1 (model 2.1), financial secrecy is a highly significant predictor of FDI-normalized cross-border sanctioned entity density ($p = 0.003$)—which we assume to be broadly indicative of the impact of financial secrecy, at the intermediary/host jurisdiction level, on non-tax-related illicit financial risks in general.



Sources: World Governance Indicators, Financial Secrecy Index, Haberly (2025), Haberly et al. (2024)

Figure 1. Calibration data for actor home country (left) and proximate jurisdiction (right) illicit financial risk functions

The geographic distribution of *cross-border* sanctioned entities—i.e. of entities located *outside of* the home countries of underlying sanctioned actors themselves—can likely be assumed to be acceptably non-biased (in relation to financial secrecy) for the purposes of estimating the proximate jurisdiction-level sensitivity of non-tax international illicit financial risks to financial secrecy. However, the *home* country distribution of US sanctioned actors themselves is too heavily politicized as well as geographically concentrated to be effectively used to estimate the sensitivity of actor *nationality*-level illicit financial risks to home country institutional and political characteristics. To estimate this, we rather use a second new large-scale dataset detailing the architectures of all international financial networks documented in US Foreign Corrupt Practices Act (FCPA) cases (Haberly, Garrod and Barrington 2024). The substantial lag in FCPA case enforcement, from the conduct of targeted activities, means that the window into illicit financial architectures provided by this dataset is mostly on the order of 10-25 years old—making it unsuitable for use in estimating the impact of contemporary financial secrecy. However, the relatively apolitical and geographically expansive nature of historical FCPA case enforcement (particularly as compared to sanctions)—combined with the fact that the country institutional and political factors likely to impact illicit finance tend to change on relatively slow timescales—makes it suitable for use as a dependent variable in the calibration models for the actor home-country rule of law risk sensitivity function.

Table 1. Illicit financial risk function calibration models

Model	1.1	1.2	2.1	2.2
Dependent Variable	Log FDI normalized FCPA cases (send & receive)	Log FDI normalized FCPA cases (send & receive)	Log FDI normalized cross-border sanctioned entities	Log FDI normalized cross-border sanctioned entities (nationality risk adj.)
adj. r2	0.58	0.43	0.09	0.082
WGI rule of law (2023)	-0.62***			
Vdem rule of law (2023)		-1.65***		
FSI secrecy score (2025)			0.027**	0.023**
Constant	-3.88***	-2.90***	-5.46***	-3.57***

Sources: World Governance Indicators, V-Dem, Financial Secrecy Index, Haberly (2025), Haberly et al. (2024)

The assumption here, again as a first-order approximation, is that the impact of actor home country rule of law on corruption-related international IFF risk is broadly representative of the impact of rule of law on other categories of international IFF risk. Given the close link between corruption and most other types of illicit activities (e.g. organized crime), this assumption is likely to be broadly reasonable for the purposes of the general illicit financial risk assessment exercise here. However, to account for uncertainty on this point, we apply sensitivity analysis to the actor home country-level rule of law risk function. Specifically, we test the impact of an alternative actor home country illicit finance risk function to

account for the possibility that the incidence of other types of illicit (e.g. criminal) activity may be less responsive to rule of law than international corruption (i.e. relatively more prevalent than international corruption in countries with relatively strong rule of law). This alternative actor home country risk function function is derived by changing the slope and intercept of the international corruption-derived risk function within 95% confidence bands—based on the assumption that the relative sensitivity of IFFs in general to rule of law is unlikely to deviate by more than this from the relative sensitivity of corruption-linked IFFs to rule of law (see Appendix A). Importantly, as shown in Appendix A, changes to the actor home country risk function in practice mostly only impact the total quantity of illicit financial risk estimated to impact different economies, with the geographic distribution of the actors estimated to be driving these risks surprisingly insensitive in most cases to changes in the actor home country risk function (despite the factor of 2.5 change between sensitivity analysis scenarios in the estimated relative illicit financial risk intensity between countries with high versus low rule of law). What this suggests is that—*provided that rule of law is assumed to be sole actor home country risk parameter*—the specific choice of calibration dataset for the actor home country risk function is unlikely to dramatically bias the picture of the relative geographic composition international illicit financial risks, even if the total scale of national illicit financial risk envelopes remains subject to substantial uncertainty.[6]

To construct the dependent variable of international illicit financial activity intensity, for the estimation of the actor home country risk sensitivity function, we use the sum of the normalized incidence of FCPA bribery incidents at both the bribe paying country side

[6] What is crucial here is that the that the home country risk function is defined only by the single parameter of rule of law, with the risk coefficient for the very highest risk actor home country (i.e. with the lowest observed rule of law) fixed at 1. Consequently, the choice of calibration dataset can only affect the estimated shape and slope of risk decline from this highest risk case to lower risk cases, along the single dimension of rule of law. What our sensitivity analysis suggests is that so long as the shape of this function is broadly exponential, the geographic composition of illicit financial risks appears to be relatively insensitive to function slope, with the latter rather primarily appearing to impact the total quantity of illicit financial risks. For developing countries, the key reason for this appears to be the overwhelming centrality of local actors in driving national illicit financial risks, which renders the precise actor home country risk function largely moot in practice. In contrast, the estimated composition of illicit financial risks in developed countries is somewhat more sensitive to changes in the actor home country risk function. However, this also appears to be mitigated in practice by the disproportionate mediation of illicit financial risks linked to actors from countries with low rule of law through high secrecy jurisdictions, combined with the fact that the estimated slope of the financial secrecy risk function is itself inversely dependent on the slope of the rule of law function (i.e. the less sensitive the combined risk function is to rule of law, the more sensitive it becomes to financial secrecy; see below). For additional details see Appendix A and discussion in section 4. Notably, in contrast to the relative insensitivity of results to the actor home country rule of risk function, our analysis indicates that results are much more sensitive to the choice of rule of law index itself. Our approach to dealing with this has been to try to empirically determine which such index is the best predictor of observed IFF risks, rather than combining results derived from alternative indices irrespective of empirical predictive power (see discussion above).

(normalized by outward FDI) and the bribe receiving country side (normalized by inward FDI) (using bribery incidence counts, rather than bribe values, to avoid the results being skewed by particularly large cases). Meanwhile, for the independent variable, we test the impact of two alternative metrics of rule of law which have broad enough international coverage (particularly of high-risk countries) for the purpose of the analysis—namely from the World Governance Indicator (WGI) and V-Dem datasets. As shown in table 1, both of these rule of law indices have a highly statistically significant ($p < 0.001$) impact on the dependent variable (normalized international corruption risk). However, WGI rule of law is a substantially stronger predictor of international corruption risk than the V-Dem rule of law variable (r^2 0.58 vs 0.43). Consequently, we use WGI rule of law for our actor home country rule of law risk estimation here (model 1.1). As for the estimation of the impact of financial secrecy, the heteroskedastic distribution of data requires a log-transformation of the dependent variable—implying that the impact of actor home country rule of law on IFF risks (within the parameters of the above assumptions) is exponential rather than linear (figure 1 left).

The need (for the reasons described above) to use two different calibration datasets to estimate the sensitivity of illicit financial risks to actor home country rule of law on the one hand, and to proximate jurisdiction-level financial secrecy on the other hand, makes it impossible to simultaneously model the combined impact of both of these on illicit financial risks. This raises the possibility that the impact of rule of law at the actor home country level could potentially be double-counted, in the combined risk function, in the impact of financial secrecy at a proximate jurisdictional level—i.e. to the extent that actors from countries with low rule of law are disproportionately attracted to intermediary jurisdictions with high financial secrecy. To compensate for this, we draw on the third large novel dataset employed here—i.e. of FDI cross-disaggregated by immediate jurisdiction and ultimate investing country—to estimate an average foreign investor home country rule of law risk coefficient for all jurisdictions. This allows us to calculate estimates of foreign investor home country risk-adjusted inward FDI, across all jurisdictions at a proximate level. This foreign investor nationality risk-adjusted inward FDI is, in-turn, used to re-normalize cross-border sanctioned entity count in the final financial secrecy risk calibration models. As can be seen in table 2 (model 2.2), this average foreign investor home-country risk adjustment does in fact substantially reduce the estimated sensitivity of proximate jurisdiction-level illicit financial risks to financial secrecy, indicating that actor home country risk is indeed being partially double-counted in the unadjusted combined risk function.

The illicit financial risk envelope estimation approach here seeks to define a space within which illicit financial risks could theoretically exist, for financial flows and positions

between varying combinations of country, immediate counterparty, and actor nationality—based on the assumption that the illicit fraction of any given international trade and investment relationship cannot exceed 100% for the highest-risk combination of these geographic and actor dimensions. A constant is thus applied to the illicit financial risk functions such that the lowest observed level of rule of law (at the actor home country level) and highest observed level of financial secrecy (at the immediate jurisdiction level) correspond to an illicit financial risk coefficient of 1. The final combined (3D) illicit financial risk function thusly produced (for activities by actors from country i, between jurisdictions j and k) is:

$$Risk_{i,j,k} = Risk_i * Risk_{j,k}$$

Where the baseline risk function is:

$$Risk_i = 321 * 10^{(-.62(Law_i)-3.88)}$$

$$Risk_{j,k} = 50.6 * 10^{(0.023(Secrecy_{j,k})-3.57)}$$

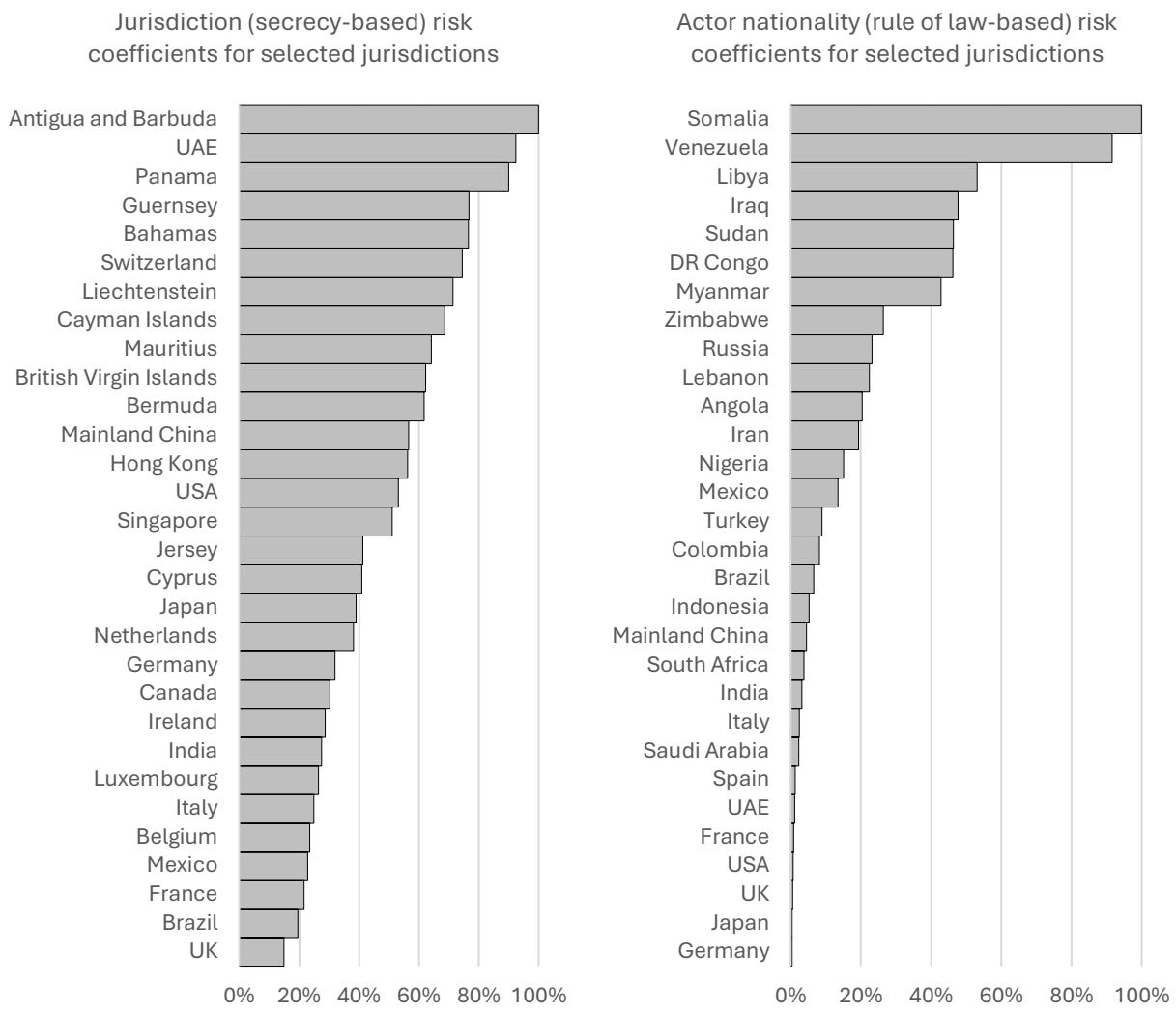
And the alternative risk function, with lower actor home country rule of law sensitivity, and financial secrecy sensitivity re-estimated based on the new resulting foreign investor risk adjusted FDI normalization, is:

$$Risk_i = 420 * 10^{(-.52(Law_i)-3.78)}$$

$$Risk_{j,k} = 81.1 * 10^{(0.023(Secrecy_{j,k})-3.78)}$$

Where Law_i is rule of law in country i, and $Secrecy_{j,k}$ is the higher of the secrecy scores of jurisdictions j and k.

The resulting risk coefficients for selected countries, on the basis of jurisdiction financial secrecy (left) and actor home country rule of law (right), are shown in figure 2. As can be seen, the risk functions for both are not only exponential, but also very steep. For jurisdiction financial secrecy, there is an estimated factor of 16 difference in illicit financial risk between the most secretive (Antigua and Barbuda) and least secretive (Slovenia) jurisdictions. Meanwhile, for actor home country rule of law, there is an estimated factor of 386 difference in risk between the countries with the lowest (Somalia) and highest (Finland) rule of law. In the alternative (lower rule of law sensitivity) actor nationality risk function, this ratio drops by more than half to a still extremely pronounced factor of 155 difference (which in-turn produces only a very small change in the foreign investor nationality risk-weighted sensitivity of jurisdiction-level illicit financial risk to financial secrecy).



Sources: World Governance Indicators, Financial Secrecy Index, Haberly (2025), Haberly et al. (2024)

Figure 2. Selected jurisdiction financial secrecy (left) and actor home country rule of law (right) illicit financial risk coefficients (baseline risk function)

The resulting risk coefficients notably imply quite conservative constraints on the maximum estimated concentration of non-tax illicit financial flows for lower risk observations, particularly when the actor home country and jurisdiction risk coefficients are multiplied together in the combined risk function. The actor home country risk coefficient for the United States in the baseline model, for example, is 0.6%, which is in practice further reduced in the combined risk function by multiplication with jurisdiction secrecy coefficients (e.g. 53% for the US). In the alternative risk estimation model (with lower actor home country risk sensitivity to rule of law), the actor home country risk coefficient for the US rises to 1.4%. To put these figures in context, other research has estimated the overall scale of the criminal economy in the US at slightly more than 1% of

GDP (Soloveichek, 2019), i.e. somewhat higher than the above coefficients when the combined impact of rule of law and financial secrecy is taken into account.[7]

The fact that actor home country rule of law risk is estimated here to be more than an order of magnitude more powerful than proximate jurisdiction financial secrecy risk, in driving overall non-tax illicit financial risk, underscores the importance of assessing these risks on a combined actor nationality and proximate geographic jurisdiction basis—rather than only on the basis of the latter. Previously, however, no datasets of international trade or investment were available that would allow for the large-scale international estimation of IFF risks on such a two-dimensional nationality and jurisdiction basis.

Here we employ a new dataset of FDI in 55 host countries, constructed through the large-scale integration of micro-level Orbis company structure and official FDI data, which provides an estimated matrix of inward FDI for each country that is cross-disaggregated on the basis of both immediate and ultimate investing country (see Haberly and Lawrie 2026). For 18 of these host countries, representing 75% of world GDP, the latter ultimate investor country classification is further augmented through the systematic manual researching of the true ultimate beneficial ownership of more than 12,000 nominal group ultimate owners registered in offshore jurisdictions (which would otherwise be classified, on the basis of the original Orbis data, as the ultimate investing jurisdiction).

In addition to using it as direct window in to the ultimate nationality of investors in the global FDI network, we use this dataset to make second-order inferences regarding the likely actor nationality composition of international trade, portfolio, and banking flows (as well as total investment stocks; see below) between particular pairs of jurisdictions on an immediate basis. For international trade, the assumption here is that the nationality breakdown of the actors driving trade flows (in both directions) between two jurisdictions broadly corresponds to the nationality of the actors driving bilateral FDI (again in both directions).[8] Similarly, the nationality breakdown of portfolio investment and cross-border non-bank claims on banks (i.e. mostly deposits), between particular countries, is assumed to broadly correspond to the nationality composition of bilateral FDI.[9] Finally, the

[7] As described in the results in section 4, the estimated maximum concentration of IFFs for the US on a geographic basis, as derived from the risk function here, is in practice somewhat higher than that implied by the local actor nationality risk coefficient, due to the dominant estimated role of foreign developing country actors (with higher home country risk coefficients) in driving developed country IFFs.

[8] This is grounded in the observation that trade tends to be mostly conducted between related parties (see UNCTAD 2013), with trade-related IFFs, in particular, likely to be mediated primarily through related-party transactions.

[9] In theory, these estimates of the ultimate nationality breakdown of portfolio investment might be augmented, for offshore conduit jurisdictions, by taking into account the composition of the portfolio investment entering these jurisdictions. However, as portfolio investment data is only reported in the CPIS in

nationality of bilateral international bank claims is estimated at a more direct and granular level from bank balance sheet (asset) data in the underlying Orbis micro-data used to construct the FDI dataset used here.[10] Bilateral trade, portfolio, and banking data used here are obtained from the WITs, IMF CPIS, and BIS locational banking datasets respectively (with trade data from 2022, and all other data from 2023).

We use these derived matrices of international trade and investment to estimate trilateral—i.e. cross-disaggregated actor nationality, country (geographic), and immediate counterparty (geographic)-based—non-tax illicit financial flow (IFF) as well as stock (IFS) risks, for 10 major developed and developing economies and international financial centers: Brazil, China, India, Iran, Russia, South Africa, Turkey, the UAE, UK, and US. To estimate illicit financial stock (IFS) risks, the combined actor home country and jurisdiction risk coefficients (at the country and immediate country counterparty levels) are multiplied directly with the estimated trilateral matrices of total FDI, portfolio investment, and cross-border banking claims. Meanwhile, to estimate illicit financial flow (IFF) risks, actor home country and jurisdiction risk coefficients are multiplied by either estimated 2023 gross flow or 2015-2023 net flow values for different components of trade and investment (with the 2015 baseline for net change corresponding to the year of data in an earlier version of the FDI dataset used here; see Haberly 2024). For trade flows, 2023 gross values are used. Meanwhile, for FDI and portfolio investment flows, which are assumed to represent the long-term accumulation of assets, average 2015-2023 net annual flows are used.

For cross-border claims by banks, average 2015-2023 net annual flows are also used, based on the assumption that these claims represent a combination of long-term loans, and interbank positions netted out on an ongoing clearing and settlement basis. However, for cross-border non-bank claims on banks, i.e. (primarily) non-interbank deposits, this is not considered to be an appropriate representation of IFF transaction flow risk volumes—as any given stock of bank deposits supports an ongoing flow of current transactions. As a first-order working approximation (in the absence of directly available data) we apply a very simple rule of thumb assumption that annual flows through non-interbank deposits are equal to 2023 non-bank deposit stocks. This is based on the observation that total bank deposits across the countries examined here are roughly equal to their respective GDPs

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the outward direction, this would result in a systematic undercounting of offshore-mediated investment from particularly high-risk non-reporting countries such as e.g. Venezuela or Russia, making such an approach unsuitable for the present analysis; see results in section 4 below.

[10] While this analysis could theoretically be augmented through the use of BIS consolidated in addition to locational data, this would introduce similarly systematic biases with respect to the coverage of banks headquartered in BIS reporting versus nonreporting countries as would arise from attempting to take into account CPIS data on the composition of portfolio investment entering offshore jurisdictions (see previous note).

(with a median GDP/deposit ratio of 1.45, a mean of 1.55, and a 0.85 aggregate ratio for all 10 countries; with ratios of 0.84 and 1.7 for the UK and US).

This, assuming that economic activity is mediated through bank accounts, implies something on the order of a one-year average deposit turnover rate throughout the banking system as a whole—which we use for the purposes of the baseline IFF risk envelope estimation. In practice, however, this can be treated as a lower-level estimate of non-interbank deposit flows, with the actual level likely being higher in most cases. Notably, for the UK, which is the country whose overall IFF risk profile is most strongly linked to banking (see below), a somewhat more direct (albeit still rough) estimate of average non-interbank deposit turnover rates can be calculated by taking the ratio of non-CHAPS (i.e. non-interbank wholesale) sterling payment facilities to total non-interbank sterling deposits. For 2023, this calculation suggests that each GBP of non-interbank deposited funds supported something on the order of 2.7 GBP of annual transactions. To gauge the impact of uncertainties in non-interbank deposit turnover rates, we conduct a sensitivity analysis using this higher estimated flow/stock ratio of 2.7:1 (as opposed to the baseline ratio of 1:1) across all countries (see Appendix A). In practice, the UK is the only country where this has a major impact on overall IFF risks (which are roughly two times higher, at an aggregate national level, in the higher deposit turnover model).

For the presentation of results in the following section, the inward and outward illicit financial trading and investment flows (and stocks) between any two countries (on an immediate and actor nationality basis) are shown aggregated together. While this is partly to facilitate the simplified presentation of overall results, it also reflects the underlying ambiguity surrounding illicit financial flow and stock directionality in this context. For trade-linked IFFs, mis-invoicing can be just as easily used to move funds in either direction via either exports or imports—with the methodology used here (in contrast to specifically trade-linked IFF estimation methodologies) unable to directly estimate this directionality. More broadly, illicit financial flows typically need to be conceptualized as international financial circuits (including e.g. return earnings on assets, and repatriation / reinvestment / consumption of income flows), rather than as unidirectional inward or outward stocks and flows. Particularly important in this respect, as described below, is the fact that illicit financial risks tend to be disproportionately concentrated in “round-trip” investment circuits, wherein what are, in effect, the domestic financial operations of local actors are mediated through overseas (and in particular offshore) structures—and thus simultaneously recorded as inward and outward investments of various types. Importantly, the prevalence of this round-tripping behavior also implies a potential for double-counting the same internationally invested funds. We compensate for this, for FDI and portfolio investment in the illicit financial stock (but not flow) models, by using the higher of total

outward or inward illicit financial risk (rather than the sum of these) for any given combination of actor nationality, country, and immediate counterparty jurisdiction.

Table 1. Summary data for countries examined in analysis

Country	Nominal GDP (2023)	% World GDP (2023)	Imports & exports (2022)	In & out FDI stock (2023)	In & out portfolio invest. stock (2023)	Bank assets & liabilities (2023)	Rule of law (2023)	Secrecy score (2025)
Brazil	2,191	2.1%	622	1,061	495	382	-0.31	50
China	18,270	17.2%	5,854	6,605	2,681	1713*	-0.04	69.7
India	3,638	3.4%	1,175	846	1,027	222*	0.19	56.2
Iran	405	0.4%	125	67*	0.4*	6*	-1.06	-
Russia	2,072	1.9%	819**	586*	48*	238*	-1.19	69.7
S. Africa	381	0.4%	229	262	361	102	0.09	61.5
Turkey	1,118	1.1%	580	253	80	121*	-0.51	61.9
UAE	514	0.5%	933	504*	147*	391*	0.88	78.9
UK	3,370	3.2%	1,339	4,753	9,047	13,784	1.4	44.8
USA	27,721	26.1%	5,295	12,071	38,953	14,740	1.33	68.6

All GDP and Investment values in billions USD.

*Non-reporting country for relevant source dataset. Figures reconstructed from counterparty-reported data, plus Orbis-based Monte Carlo analysis for FDI (based on Haberly and Lawrie 2026).

**Missing 2022 bilateral trade observations for Russia filled with 2021 trade data.

Sources: World Bank WDI (GDP); World Bank WITS (trade); IMF CDIS (FDI); IMF CPIS (portfolio investment; BIS Locational Banking Statistics (bank assets and liabilities); World Bank WGI (rule of law); Tax Justice Network Financial Secrecy Index (Secrecy Scores)
Trade, FDI, portfolio investment and international banking data show sum of imports and exports / outward and investment stock / international assets and liabilities.

4. Results

The overall results for non-tax IFF (flow) and IFS (stock) risk envelope estimation, across the 10 major developed and developing economies and international financial centers examined, are presented in Figures 2-8 below. Figures 2 and 3 show the estimated geographic breakdown, on both a proximate counterparty and actor nationality basis, of illicit financial flow (figure 2) and stock (figure 3) risks. Figure 4 shows the breakdown of both IFF and IFS risks by type, across the countries examined. Figure 5 shows the aggregated sources of IFF and IFS risks across the countries examined, on both a proximate and an actor nationality basis, with the latter excluding local actors for each country (i.e. showing only foreign actor risk contributions). Finally, figures 6-8 show the impact of sensitivity analysis, at the levels of home country rule of law risk function and non-interbank deposit turnover rate, on the total scale of the IFF and IFS risk envelope for each country.

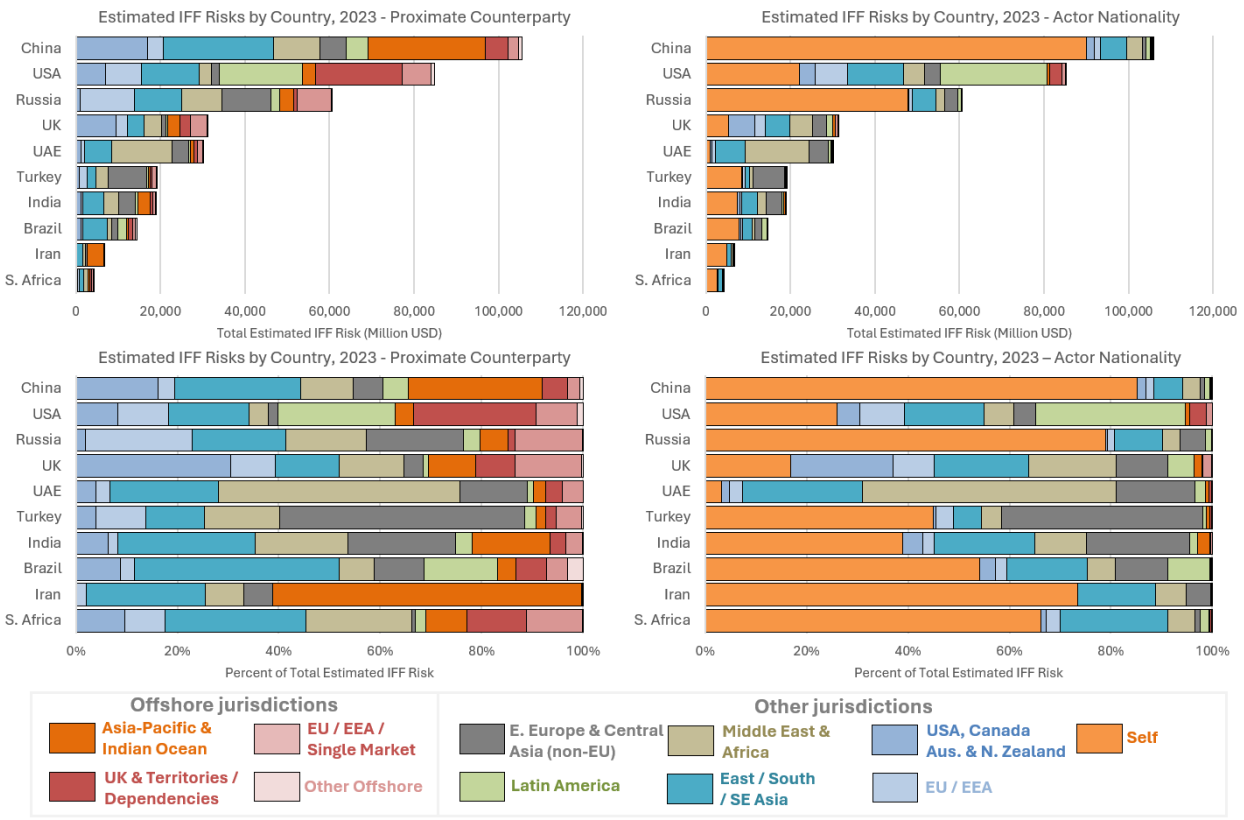


Figure 2. IFF risks for selected economies by proximate source and actor nationality

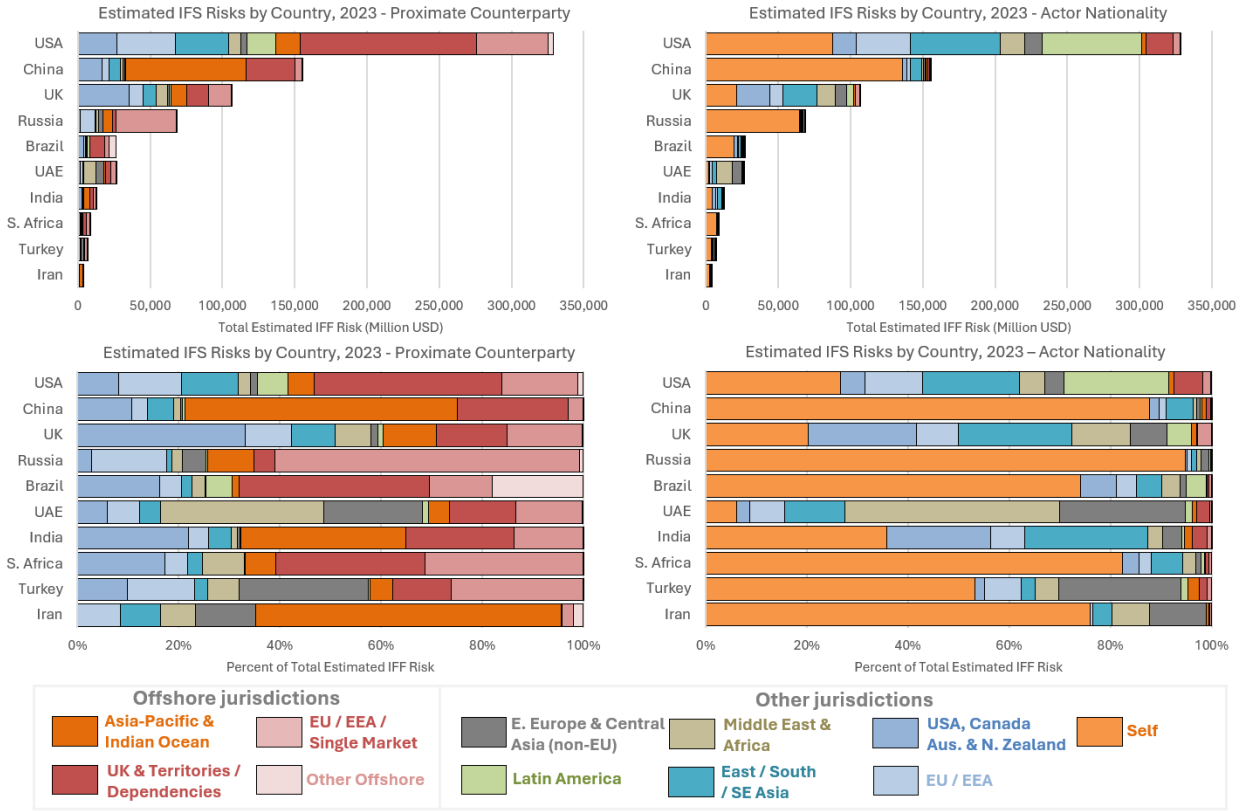


Figure 3. IFS risks for selected economies by proximate source and actor nationality

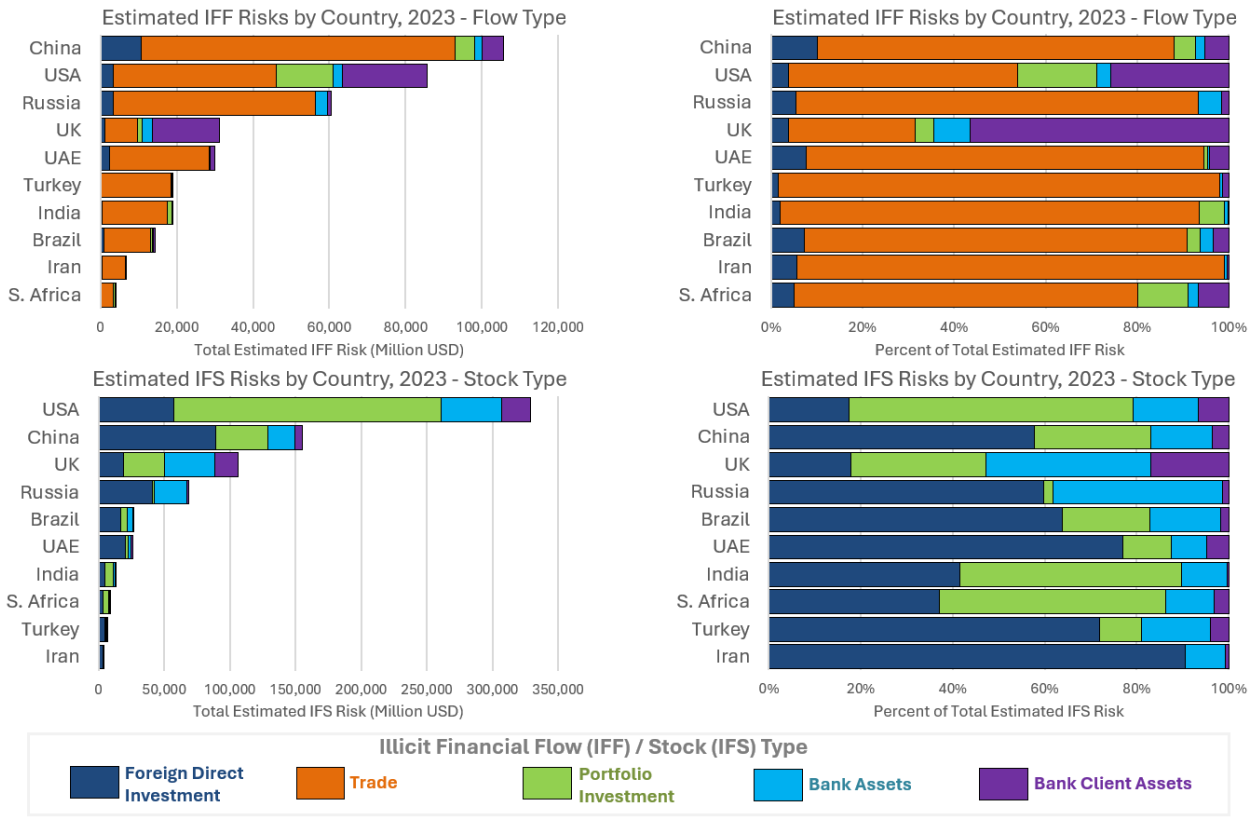
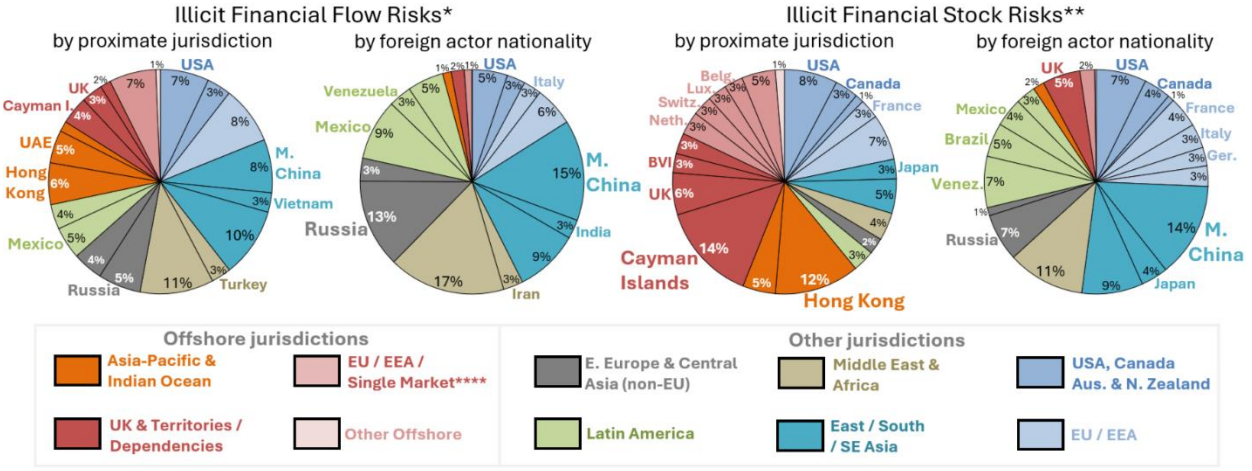


Figure 4. IFF and IFS risks for selected economies by type



Combined illicit financial flow and stock risks for BR, CN, IN, IR, RU, ZA, TR, AE, GB, US, excl. local actors for nationality-based risks
*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities ****Including Switzerland

Figure 5. Estimated contributions of jurisdictions on a proximate geographic basis and actors from countries and regions on a nationality basis to total IFF and IFS risks in other economies (within 10 countries examined)

It should be emphasized that the dollar value totals in the figures do not represent estimates of illicit financial flows or stocks, but rather the non-tax IFF and IFS *risk*

envelopes implied by the empirically-calibrated risk functions. As shown in figures 6-8, these risk envelopes are themselves subject to uncertainties that can be probed through sensitivity analysis of model parameters (in this case by varying combinations of the actor home country rule of law risk function, and bank deposit turnover rate). Notably, as can be seen in figure 8, the uncertainties surrounding total IFF risk envelope size are substantially higher for the US and UK than for the developing and transition economies examined here—with the ratios of maximum to minimum IFF envelope size varying across sensitivity analysis scenarios by a factor of 2.6 and 3.6 respectively, for the US and UK, while the respective uncertainties for all other countries span less than a factor of 2. This reflects the combined impact of stronger national rule of law—which translates into a greater sensitivity of local actor risk coefficients to uncertainty surrounding the rule of law risk function (figure 6)—as well as the greater importance of banking in international IFF risks for the US and UK (as compared to developing countries), which results greater IFF risk envelope sensitivity to uncertainty surrounding bank deposit turnover rate (figure 7).

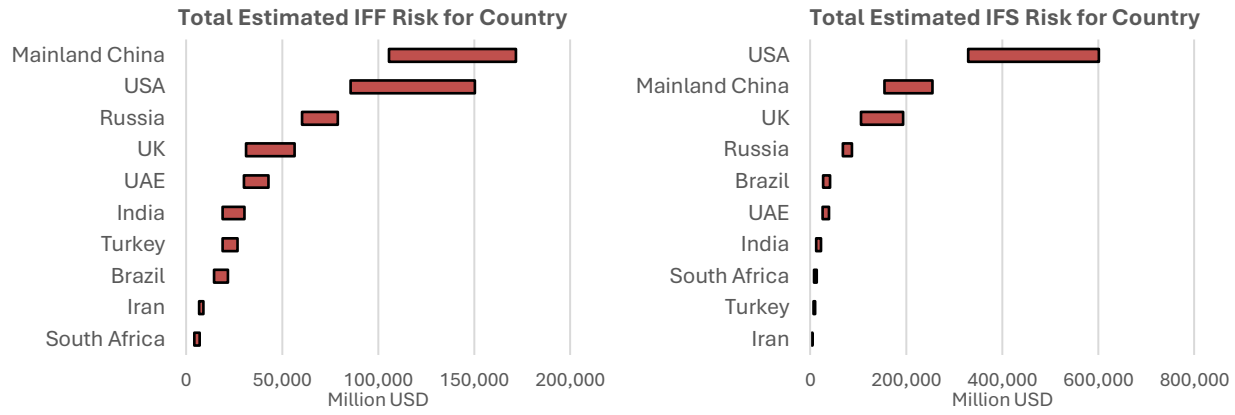


Figure 6. Impact on total illicit financial flow (IFF) and illicit financial stock (IFS) risk envelopes of changing actor home country rule of law risk function sensitivity

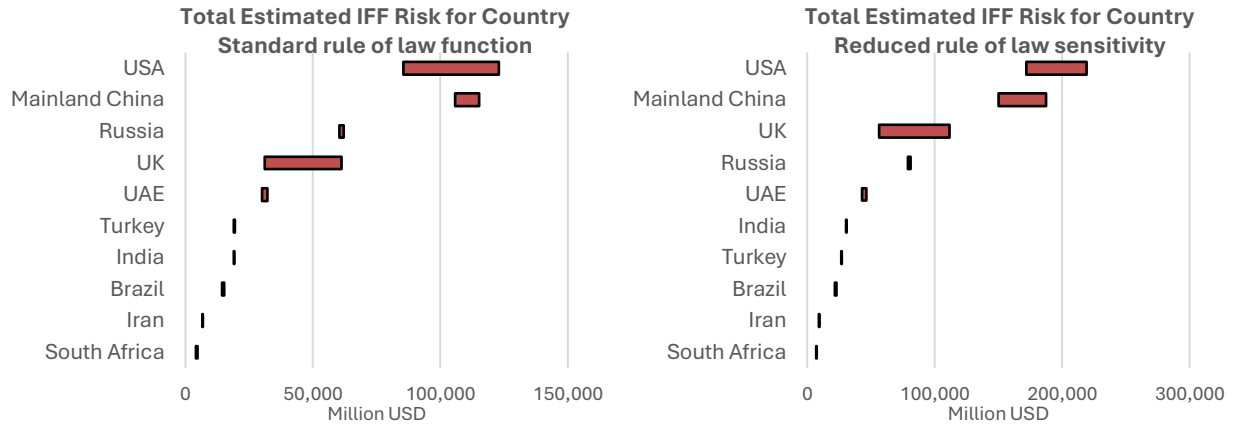


Figure 7. Impact on total illicit financial flow (IFF) risk envelopes of changing non-interbank deposit turnover rate and home country rule of law risk function sensitivity

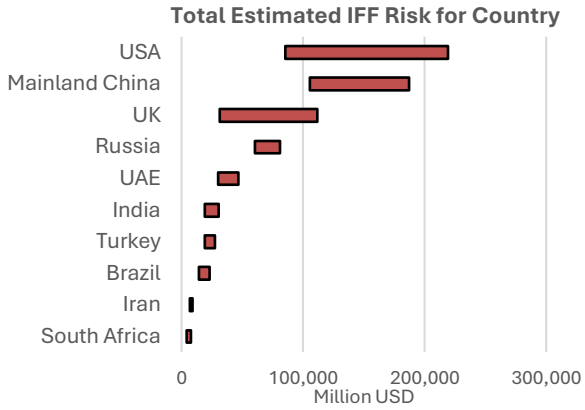


Figure 8. Combined impact of non-interbank deposit turnover rate and home country rule of law risk function sensitivity on total IFF risk envelopes

Notably, even when these uncertainties are taken into account, the total maximum non-tax illicit financial risk envelope values estimated for the countries here tend to fall towards the conservative end of prior IFF estimates (while at the same being broadly well-aligned with these prior estimates). For China, for example, the total estimated non-tax IFF risk envelope ranges from $105 billion to $187 billion, depending on the combination of home country rule of law risk function and bank deposit turnover rate applied—with the vast majority of this risk estimated to be trade-related. This compares to prior estimates of annual Chinese IFFs, as derived from the trade and balance of payments data anomaly analysis method, of $78 to over $300 billion annually (albeit for an earlier period than that examined here; see e.g. Kar and Freitas 2012; Kessler and Borst 2013)—with the comprehensive international analysis in Kar and Spanjers (2015) estimating a mean value for Chinese illicit outflows of $139 billion from 2004 to 2013, rising to $259 billion in 2013. For Russia, India, and Brazil, the estimated non-tax IFF risk envelope ranges estimated here are $60-$81 billion, $19-31 billion, and $14-$23 billion, respectively. This compares to mean estimated annual 2004-2013 IFFs, in Kar and Spanjers (2015), of $105 billion, $51 billion, and $23 billion. Meanwhile, the estimated IFF risk envelope for the UK ranges from $30 to $112 billion annually, depending on home country risk function and bank deposit turnover rate. Even the highest figure here, notably, is slightly lower than the back-of-the envelope annual UK money laundering estimate of £100 billion (i.e. ca. $130 billion) that is often cited (NCA 2025).

Beyond the relatively modest total size of the estimated risk envelopes, several aspects of the results are particularly striking. The first is the outsized share of total international illicit financial risks (within the >50% of the world economy encompassed by the 10 countries examined here) estimated to be generated by actors from a handful of relatively small

economies. This is a consequence of the highly non-linear exponential nature of the empirically estimated illicit financial risk functions. Russia, for example, with 1.9% of world GDP, is estimated to be responsible, at an actor nationality level, for 13% of total foreign actor-generated non-tax IFF risks across the 10 countries examined here. This is nearly as high as the 15% of foreign-actor risks estimated to be generated by actors from China, with 17% of world GDP, and is nearly three times as high as the 5% of total risks estimated to be generated by actors from the US, with 26% of world GDP. Also making outsized contributions to total estimated foreign actor generated risks are Mexico (9%), Venezuela (3.3%), Iran (2.9%), and Italy (2.6%)—with the latter estimated to make the second largest developed world contribution to total non-tax IFF risks, at the actor nationality level, after the United States (figure 5). Notably, the same 3 countries that are estimated here to be the leading contributors to international IFF risks, China, Russia and Mexico, were also estimated to be the leading contributors to 2004-2013 developing world IFFs in the trade and balance of payments anomaly detection-based analysis of Kar and Spanjer (2015); with the respective shares of these three countries in developing world IFFs (17%, 13%, and 7%), as estimated by this prior study, a remarkably close match to the results here.

Just as disproportionate is the role of particular jurisdictions, and above all of offshore jurisdictions, in generating bilateral illicit financial risks on a *proximate* basis. This reflects the exponential sensitivity of jurisdiction-level illicit financial risk to financial secrecy, as well as the concentration of the activities of actors from high-risk countries in offshore jurisdictions. The centrality of offshore jurisdictions is most pronounced in the distribution of illicit financial stocks (IFS), for which offshore jurisdictions are estimated to be the source of 61% of total risks on a proximate geographic basis across the 10 countries examined. The largest contribution here comes from the UK and its Overseas Territories and Crown Dependencies, which are estimated to generate more than a quarter of total IFS risks on a proximate basis. Meanwhile the EU/EEA/single market offshore jurisdictions (including Switzerland in this category) are estimated to account for a further 17% of IFS risks, with Hong Kong accounting for an additional 12% (figure 5). Notably, the contribution of offshore jurisdictions (and international financial centers broadly) to national illicit financial flow (IFF) risks tends to be highly sensitive to the assumed bank deposit turnover rate, with the UK and Cayman Islands, for example, surpassing Mexico as the leading sources of proximate bilateral IFF risks for the US in models using the higher deposit turnover rate (see Appendix A).

In addition to this lopsided distribution of international illicit financial risk sources, the results show a striking divide in estimated illicit financial risk compositions between more and less developed countries. For developing and transition economies, the results suggest that IFF risks are likely heavily concentrated in trade (figure 4). This contrasts with

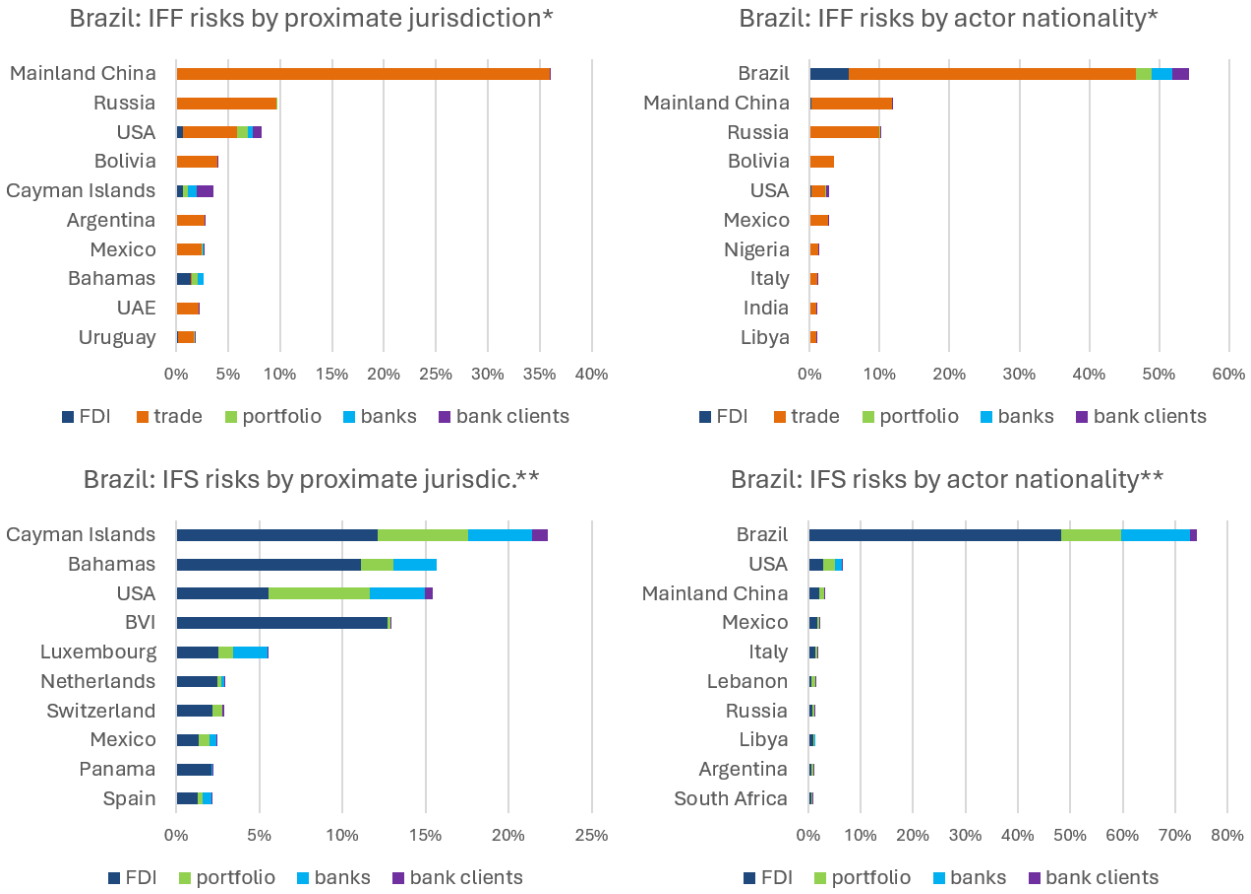
the US and UK, where IFF risks are estimated to be linked to a more complex mix of trade and non-trade-based flows—with international banking estimated to be the main locus of IFF risks in general for the UK, as well as of non-trade IFF risks for the US.

Meanwhile, IFS (stock) risks tend to be concentrated, for developing countries, in FDI positions. In contrast, IFS risks for the US and UK are estimated to be primarily concentrated in portfolio investment and banking—with the former dominating the IFS risk profile for the US, while the latter are most important for the UK. Notably, in contrast to the stark North-South divide in *IFF* risk composition, for IFS risks there are also a few countries exhibiting an intermediate pattern—with portfolio and banking-linked stock risks estimated to be relatively more important for India and South Africa than for the other developing countries examined.

There is also a marked North-South divide in the type of actors estimated to be driving national IFF and IFS risks. In developing countries, risks are usually estimated to be generated primarily by local actors. In this respect, India and Turkey are the only countries where local actors are not estimated to drive a majority of IFF risks, while India is the only country where local actors are not estimated to be responsible for a majority of IFS risks. Particularly important in driving developing country FDI and portfolio investment stock risks is so-called investment "round-tripping," wherein actors control investments in their own home countries via offshore holding structures. As shown in Haberly (2024) and Haberly and Lawrie (2026), this is often the largest overall driver of both inward and outward investment in developing and transition economies—with round-tripping accounting for roughly half of all FDI in China and Russia, for example (Haberly and Lawrie 2026).

In contrast to the predominantly local actor-generated pattern of illicit financial risks in developing countries, IFF and IFS risks in the US and UK appear to be primarily generated by foreign actors, mostly from the developing world. In both countries, locals are only estimated to generate roughly one quarter of total IFF and IFS risks in the baseline risk function model, rising to a maximum of one third in the alternative actor home country risk parameterization. For the United States, Latin America, followed by Asia, are estimated to be the largest regional sources of both IFF and IFS risks. Meanwhile, the UK has a more regionally diverse IFF and IFS risk profile, which is distributed, on an actor nationality basis, across Asia, the Middle East, Africa, and the former USSR. In contrast to the US, foreign developed country actors—and above all Americans—are also estimated to make a substantial contribution to total UK IFF and IFS risks, even if still smaller than that of developing country actors as a group.

Finally, the UAE has an estimated composition of IFF and IFS risks that can be described as a hybrid of the Anglo-American and developing world pattern. As for the US and UK, both IFF and IFS risks appear to be primarily generated for the UAE by foreign as opposed to local actors. However, the categories of risk driving the UAE's overall risk profile are more characteristic of developing countries—with flow risks estimated to be dominated by trade-linked IFFs, and stock risks estimated to be dominated by FDI.[11]



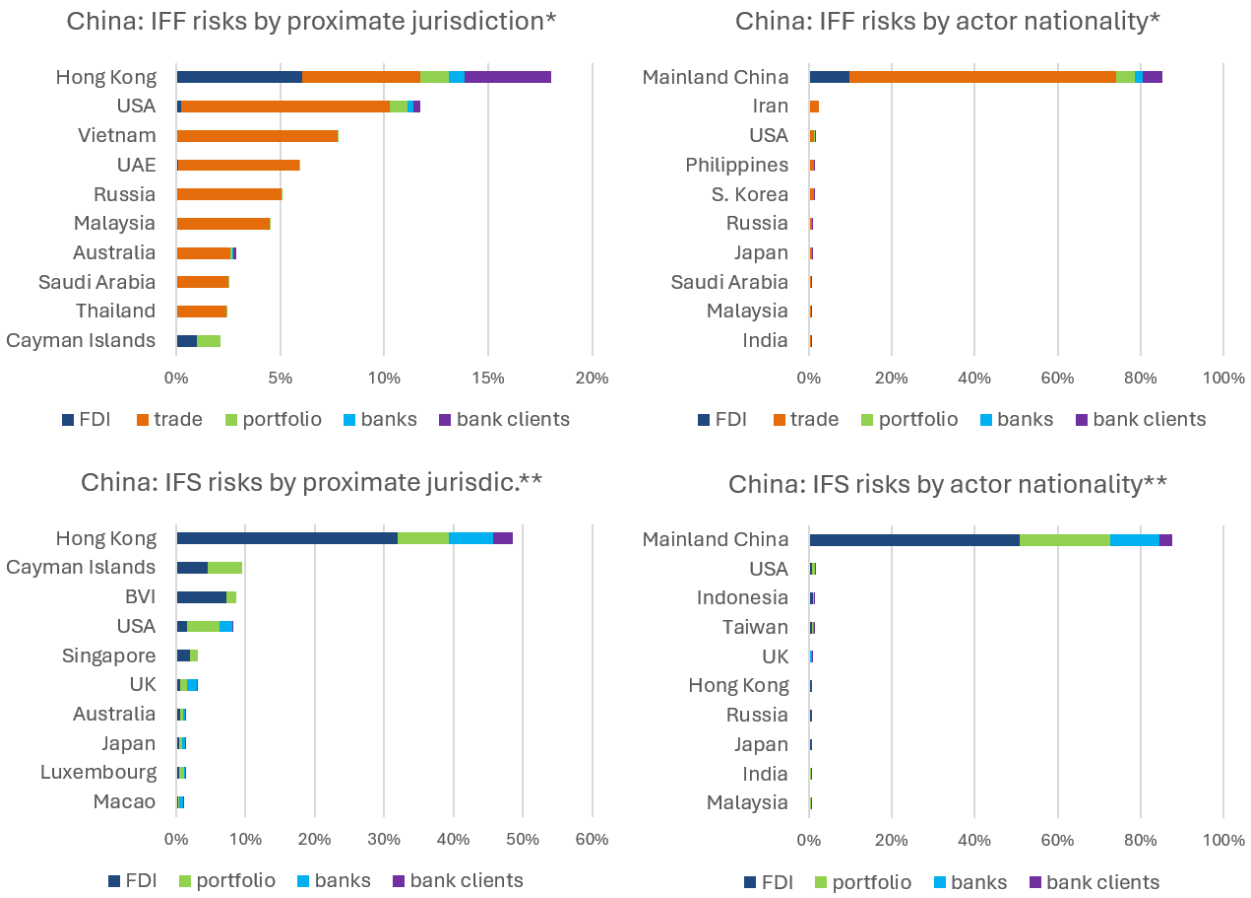
*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 9. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Brazil on a proximate geographic and actor nationality basis

Figures 9-18 provide a deeper view of national IFF and IFS risk profiles—showing a cross-disaggregated breakdown, for each of the 10 countries examined, of flow and stock risk types across the leading geographic sources of risk for each on both a proximate

[11] Notably, the fact that the UAE, uniquely among the three major international financial centers examined here, does not report any data to either the IMF or BIS on any category of international investment or banking position—which must thus be chiefly reconstructed from counterparty-reported data (supplemented for FDI by Orbis data; see Haberly and Lawrie 2026)—means that international banking and portfolio investment-mediated risks may be somewhat underrepresented in the results for the UAE.

counterparty and actor nationality basis. As can be seen, four of the seven developing countries examined (Brazil, India, South Africa, and Turkey) have a broadly similar IFF (flow) risk profile. This is dominated by trade-related flows with some combination of Mainland China and Russia on a proximate geographic counterparty basis, while being chiefly driven by locals on an actor nationality basis. For Brazil and South Africa, China is estimated to be the single largest proximate source of trade-related (and overall) IFF risks, while for India and Turkey, Russia is estimated to be largest source of risk. For Turkey, Russian actors are also estimated to generate an exceptionally high proportion of IFF risks on an nationality basis, nearly equal to that of Turkish local actors.

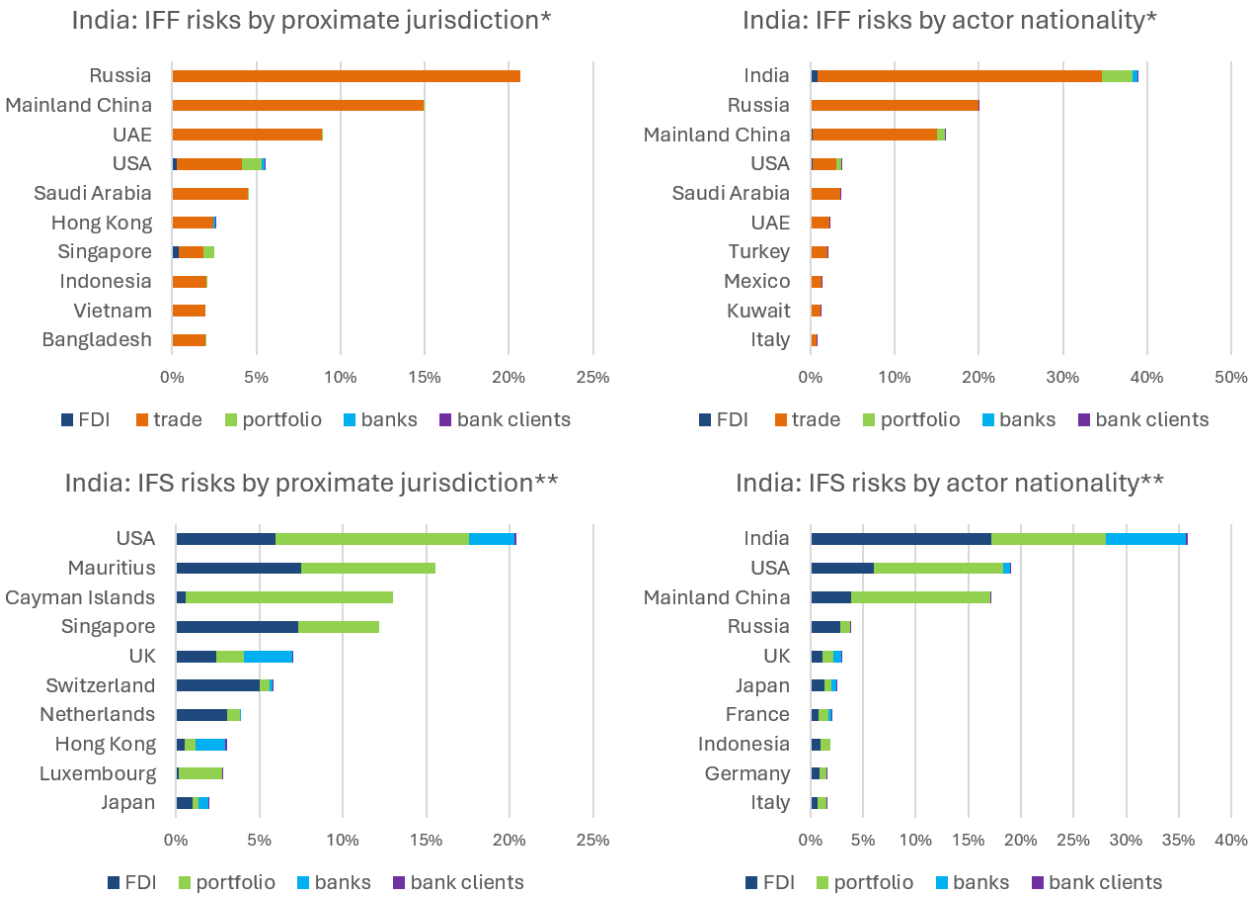


*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 10. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Mainland China on a proximate geographic and actor nationality basis

The geographic pattern of IFF risks for China, Russia and Iran looks quite different from that of the other four developing countries. As for the other developing countries examined, these risks are estimated to be concentrated in trade-related flows generated by locals on an actor nationality basis. However, in contrast to Brazil, India, South Africa and Turkey, IFF

risks are estimated to be much more strongly oriented, on a proximate geographic basis, towards intermediary jurisdictions as opposed to ultimate trading partners. For China, by far the largest focus of proximate geographic IFF risk is Hong Kong, with this risk distributed across a diverse mixture of trading and financial channels. High levels of proximate IFF risk are also estimated for trade between China and Vietnam and the UAE. As for Hong Kong, these risks are likely to be primarily driven by the role of these two countries in intermediating trade transshipment (see Ebehi et al 2024). Also estimated to represent large proximate geographic sources of trade-linked IFF risks for China, presumably on an ultimate trading partner basis, are the United States and Russia.

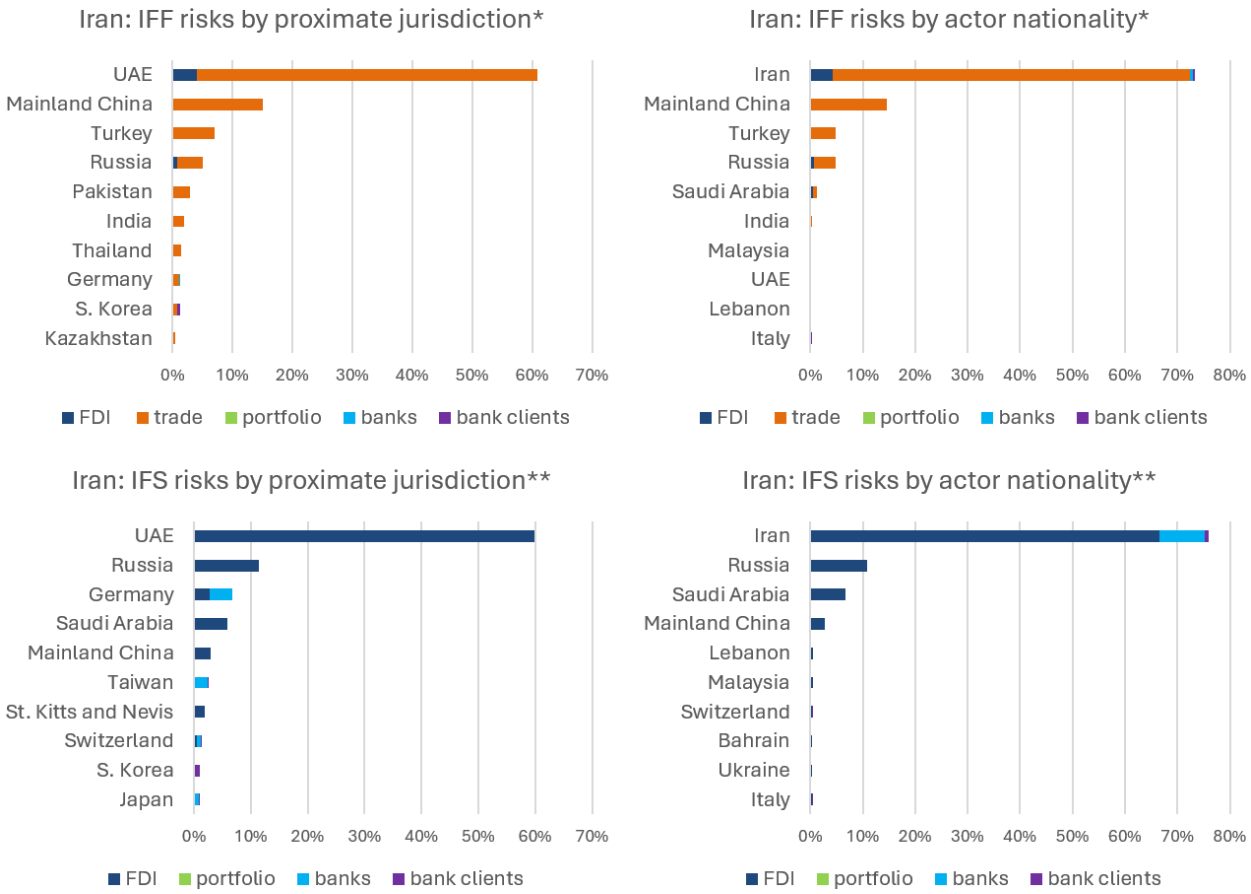


*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 11. Estimated contribution of jurisdictions and countries to IFF and IFS risks for India on a proximate geographic and actor nationality basis

Meanwhile, Russian IFF risks are estimated to be above-all focused, on a proximate geographic basis, on trade with Turkey. While some of this risk is likely associated with bilateral trade between these two countries, a large proportion is likely associated with Turkey's role as a Russian transshipment jurisdiction, including in the context of sanctions

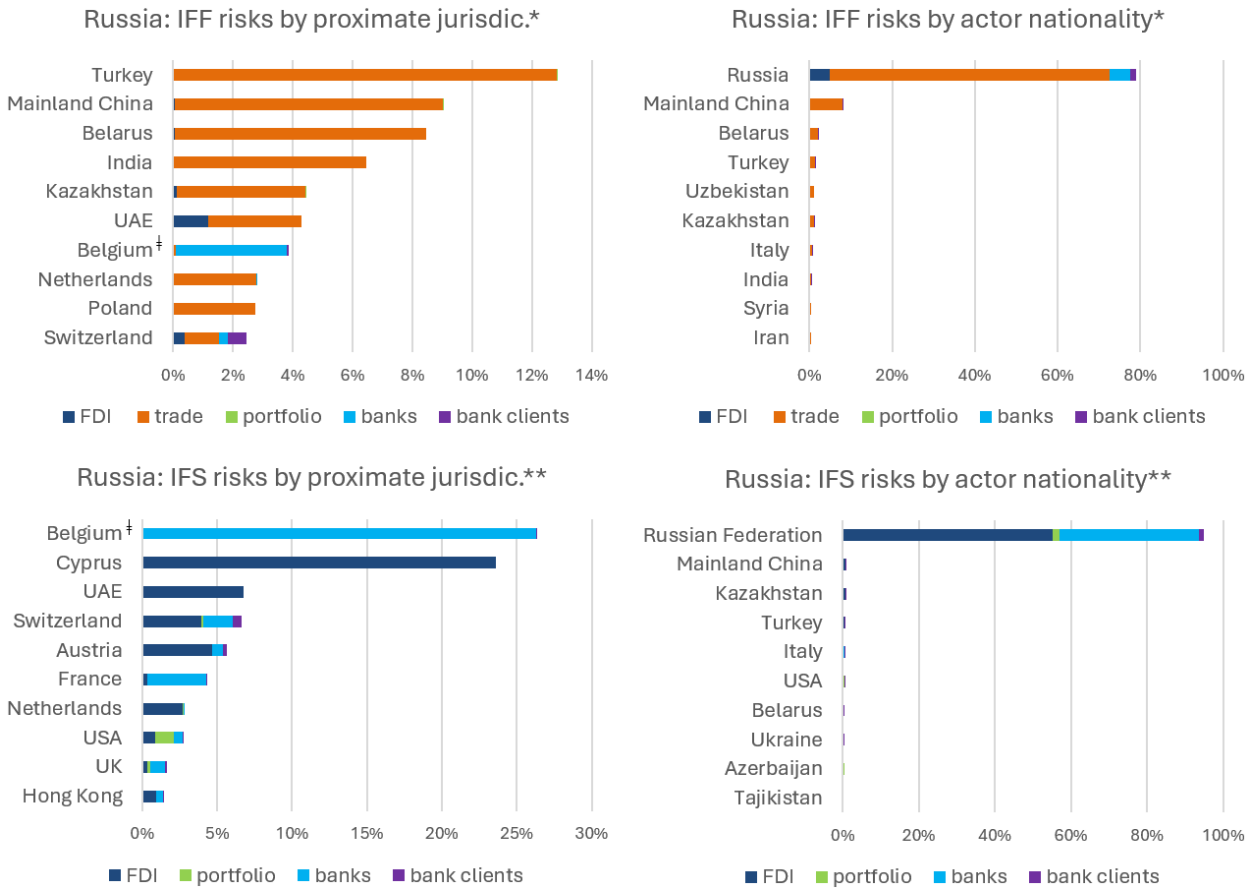
evasion (see Haberly 2025). Also featuring prominently in Russia's IFF risks (as for Turkey entirely within in the sphere of trade-related flows) are Mainland China (#2), Belarus (#3), and India (#4). Finally, Iran's IFF risks are estimated to be almost entirely (60%) mediated through the UAE on a proximate geographic basis, and concentrated almost entirely in trade-linked flows.



*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 12. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

The IFS (stock) risks for the developing and transition economies examined here—i.e. the accumulated proceeds of illicit activity—are, like IFF (flow) risks, estimated to be primarily generated by local actors. However, the geography of where these risks are estimated to be located, on a proximate basis, looks dramatically different from IFF risks, with developing country IFS risks mostly estimated to be concentrated in bilateral relationships with a combination of offshore jurisdictions, and the US and UK.



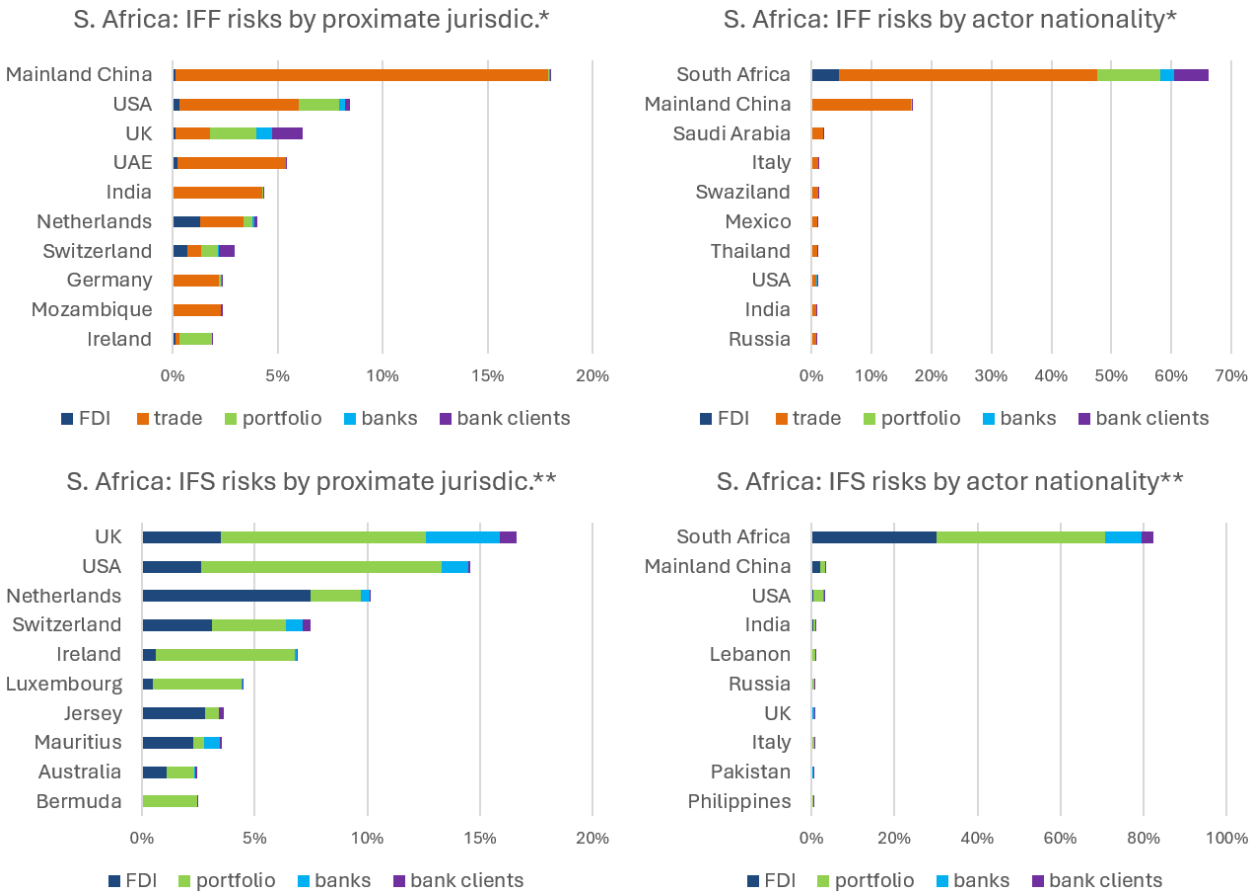
*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 13. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Russia on a proximate geographic and actor nationality basis

Most strongly oriented towards offshore jurisdictions, in the proximate geographic distribution of IFS risks, are Brazil, China, Iran, Russia and Turkey—with offshore jurisdiction-mediated risks estimated to be largely centered, for all five of these countries, on FDI and portfolio investment round-tripping. Estimated to dominate IFS risks for Brazil, are Caribbean offshore "small islands," and most importantly the Cayman Islands (#1), Bahamas (#2) and BVI (#3) (also see Stal and Cuervo-Cazurra 2011). Meanwhile, IFS risks for China are estimated to be centered on the offshore triangle of Hong Kong, the Cayman Islands, and BVI, mostly via the round-trip holding of assets in China itself (see Haberly and Lawrie 2026; Haberly and Wojcik 2022; Sharman 2012).[12] Similarly, Turkish IFS risks are most strongly oriented towards the Turkish business round-tripping hub of the Netherlands (see Haberly and Lawrie 2026), while Iranian IFS risks are, as for IFFs, strongly centered on the UAE. Notably, the methodology here locates Russian IFS risks as above all being

[12] As shown in Haberly (2024) and Haberly and Lawrie (2026), this is the single largest structure in the global offshore FDI network.

concentrated in bank positions in Belgium; however, this is an artifact generated by the housing of frozen Russian central bank assets in Belgium-based Euroclear (Caprile et al. 2025). Removing this from the picture, the largest Russian IFS risks are estimated to be located in the traditionally dominant (but declining; see Haberly and Lawrie 2026) Russian offshore incorporation jurisdiction of Cyprus, and the ascendent (post-2022) Russian incorporation jurisdiction of the UAE.

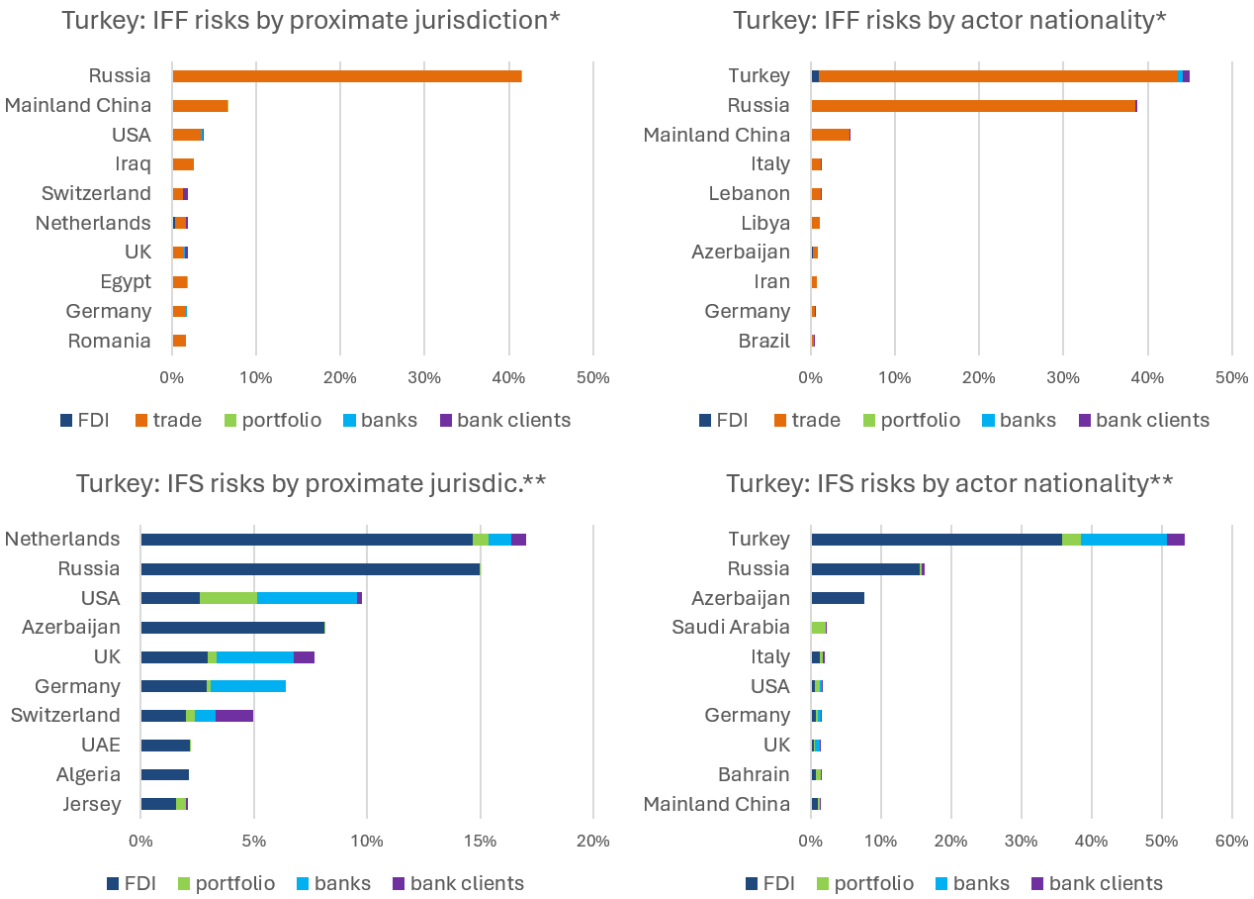


*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 14. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

Contrasting with this offshore FDI round-tripping-dominated distribution of IFS risks, for most developing and transition countries, is the IFS risk pattern for India and South Africa—which is for both estimated to be centered on the US and UK on a proximate basis, via a diverse mixture of inward and outward as well as round-trip financial position types. India is particularly unusual among the developing countries examined both in that the US is estimated to be the single largest focus of IFS risks on a proximate basis, and in that foreign actor-generated inward—as opposed to local actor-generated outward and round-trip

investment—is estimated to be a significant driver of these risks on an actor nationality basis (mostly centered on portfolio investment-linked risks from the US and China). Meanwhile, Indian round-trip investment-linked risk is estimated to be concentrated in Mauritius and Singapore, with substantial Indian outward investment risk also estimated to be located in the US as an ultimate investment destination. In contrast to India, South Africa's IFS risks are estimated, as for most developing countries, to be dominated by local actors on a nationality basis. However, they are also unusual in being focused on the UK and US on a proximate basis, with bilateral South Africa-UK risks mostly linked to South African round-tripping (FDI and portfolio), and South Africa-US risks mostly linked to (as for India) South African outward portfolio investment in the US.

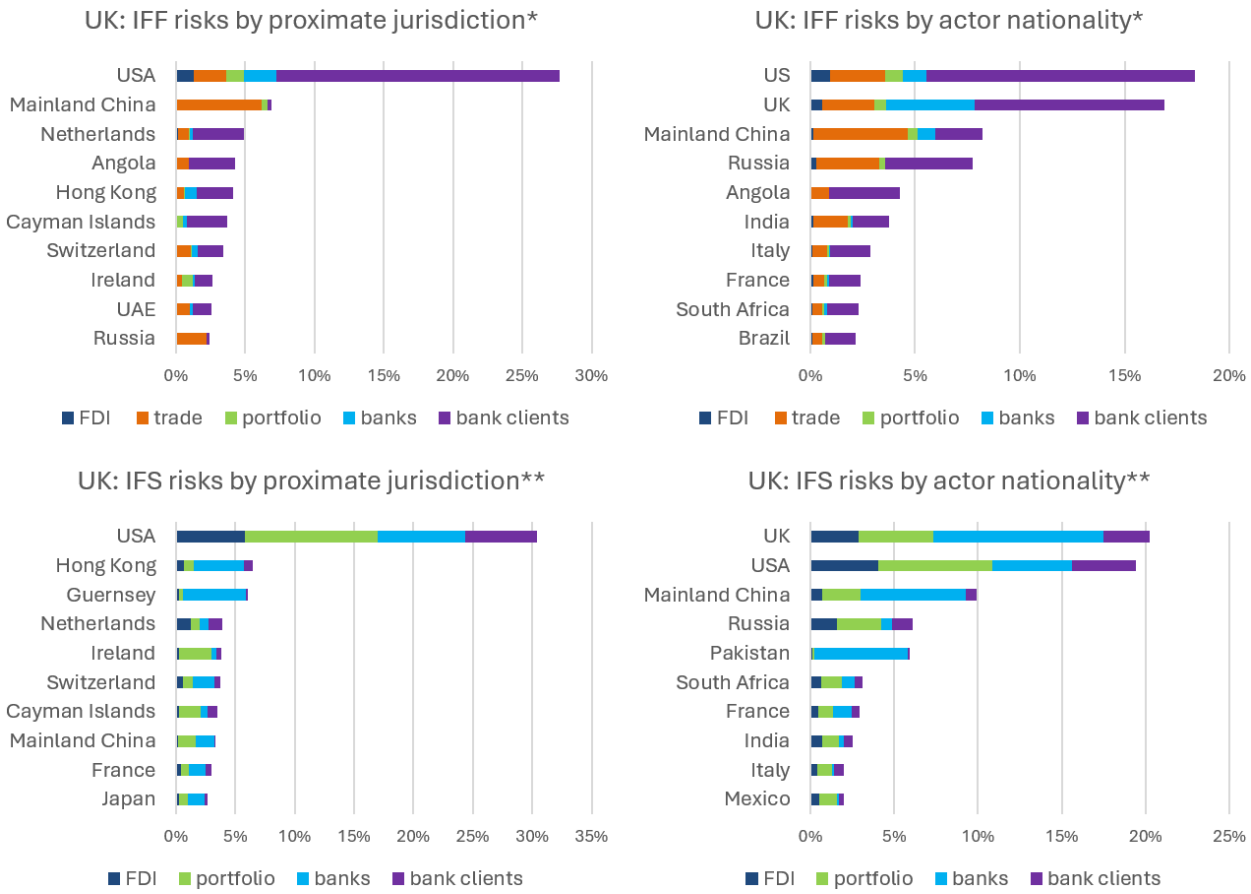


*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 15. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

Looking at the two developed countries examined, while illicit financial risks for both the US and UK are estimated to be primarily generated by developing country actors on a nationality basis, they are notably estimated to be principally focused on each other on a

proximate geographic basis—at least to the extent that the British Overseas Territories are included within the scope of UK-associated risks for the US. This is chiefly a reflection of the sheer scale of international financial ties between the US and the UK and Cayman Islands, as well as the high level of financial secrecy in the latter (notwithstanding its relatively strong performance on AML/CFT procedural compliance; see Haberly, Gullo, Shipley, Boukal, Palansky and Barrington 2024 for a discussion of this discrepancy in the British Overseas Territories and Crown Dependencies generally). For the UK, the US is estimated to be by far the most important source of both IFF and IFS risks on a proximate basis. Meanwhile, IFS risks for the US are estimated to be heavily concentrated in the Cayman Islands and the UK, which are also estimated to be (if combined together) the single largest proximate source of US IFF risks.

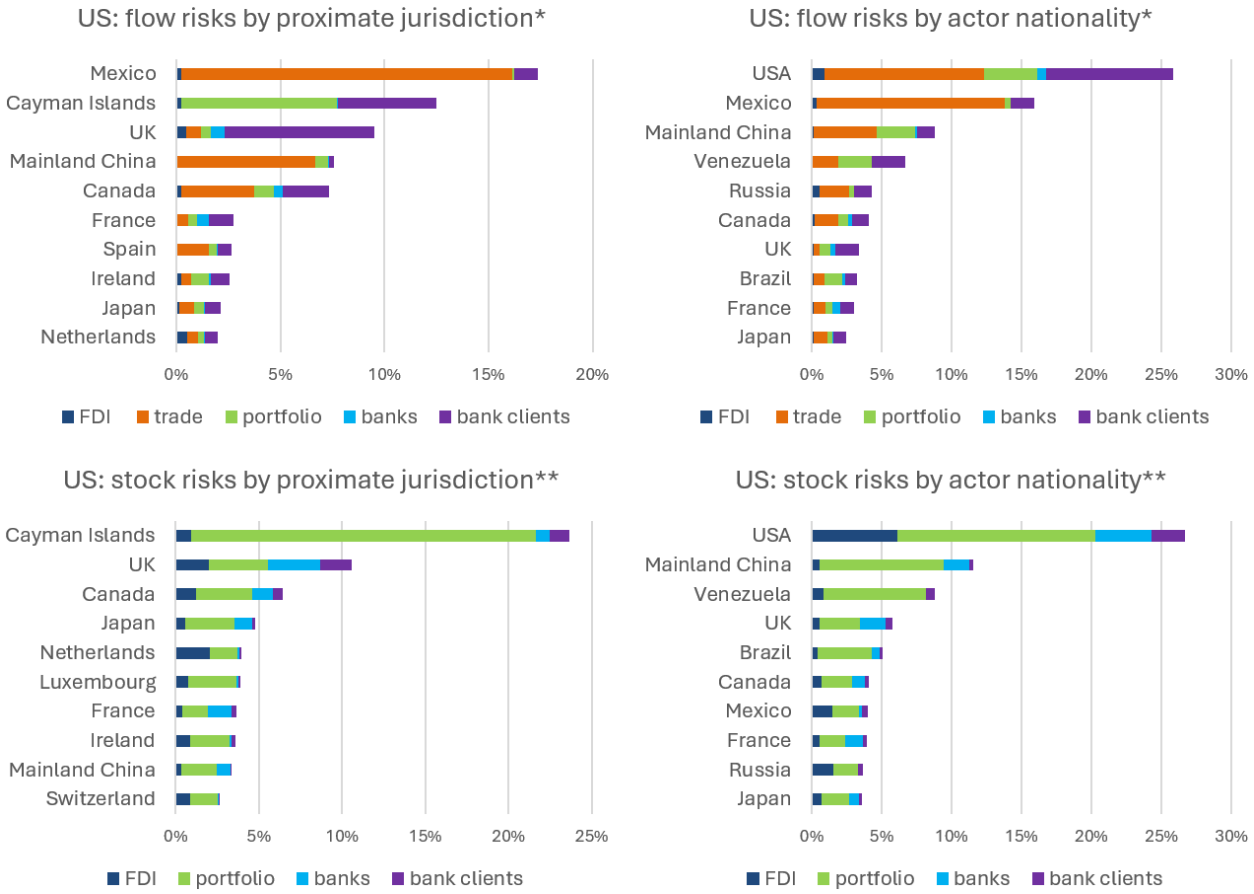


*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 17. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

Beyond this mutual domination of each others' proximate geographic IFF and IFS risk profiles, however, there are also substantial differences in the detailed pattern of illicit

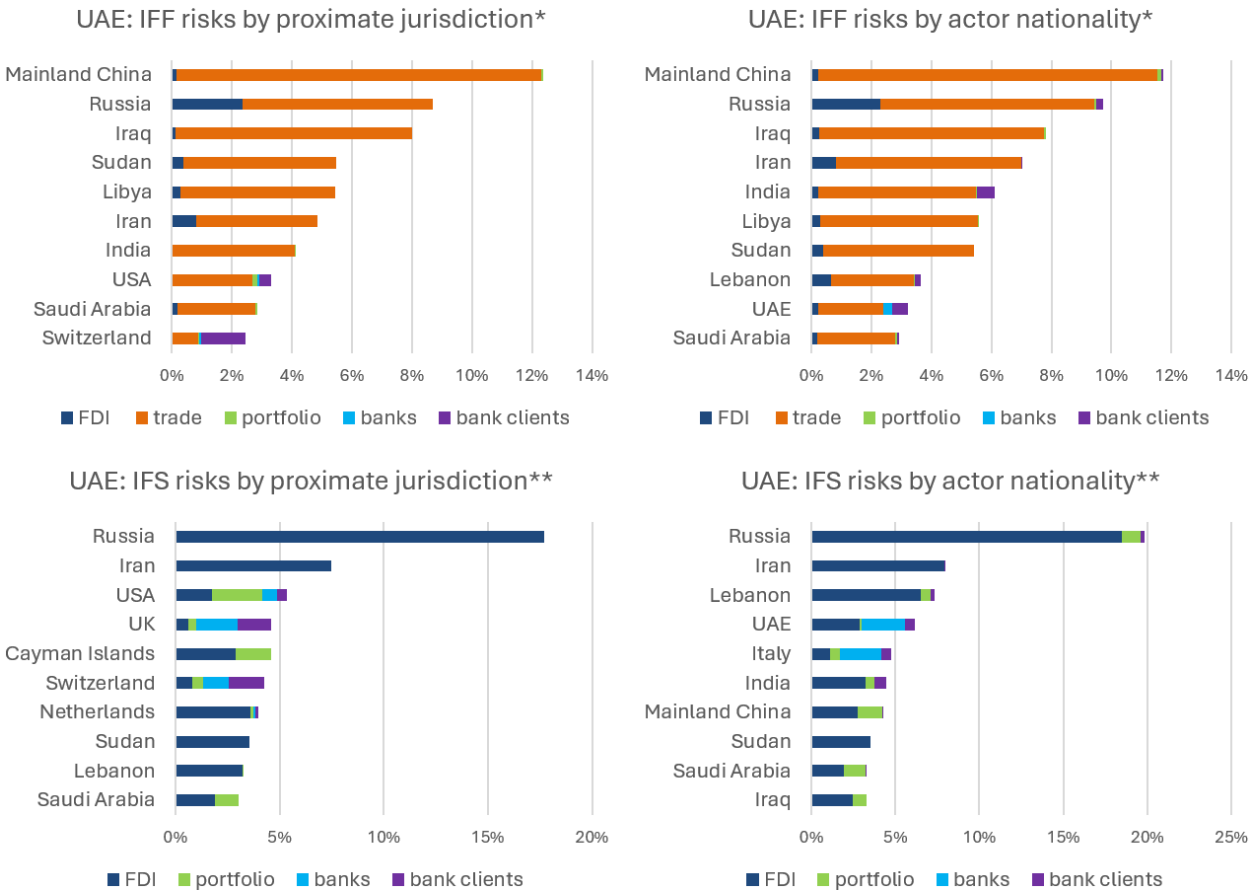
financial risks for the US and UK. For the UK, both IFF and IFS risks are estimated to be heavily concentrated in the international banking sector, to a degree that is unique among the countries examined. The largest drivers of this risk are estimated to be British national banks on the one hand, and US non-bank depositors on the other—as principally concentrated, on a proximate geographic basis, in direct bilateral banking ties between the US and UK. Also estimated to represent substantial sources of IFS risk for the UK, are Mainland Chinese banks (via Hong Hong), and possibly also Pakistani banks (via Guernsey—although a particularly high level of uncertainty surrounds this latter link, which should be treated as highly tentative in nature). Meanwhile, non-bank depositors from a larger number of developing and transition economies, and in particular Russia, Angola, Mainland China, South Africa and Brazil, are estimated to collectively generate large IFF risks for the UK. Finally, while trade appears to be far less important in relative terms as an IFF channel for the UK, as compared to any other country here, significant trade-linked IFF risks are estimated to exist between the UK and China, as well as Russia and the US.



*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 18. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

In contrast to the banking-sector focused pattern for the UK, US IFF risks are estimated to be more evenly divided between trade-related and non-trade-related flows, with the latter in-turn further subdivided between banking and portfolio-investment linked risks. Mexico, followed by Mainland China, are estimated to be by far the largest geographic sources of trade-linked IFF risks for the US, with most of this risk also attributed to actors from these two countries on a nationality basis. In contrast, Russia and Venezuela are estimated to generate significant trade-linked IFF risks for the US on an actor nationality, but not a proximate geographic basis, with these risks predominantly intermediated via third countries.



*Inward and outward foreign direct investment, portfolio investment, bank assets and liabilities, and trade-related flows (2015-2023)
**Inward and outward foreign direct investment, portfolio investment, and bank assets and liabilities (2023)

Figure 16. Estimated contribution of jurisdictions and countries to IFF and IFS risks for Iran on a proximate geographic and actor nationality basis

Notably, the enormous portfolio investment and banking-linked IFF and IFS risks inferred between the US and the UK and Cayman Islands, on a proximate basis, are estimated to be largely generated by actors from the same developing and transition economies principally responsible for US trade-linked risks—albeit with a somewhat different ranking of

importance. After American and British actors, Russian actors are estimated to be the largest source of IFF and IFS risks impacting the US via the UK. Meanwhile, apart from American round-tripping, IFF and IFS risks impacting the US via the Cayman Islands are estimated to be mostly generated by portfolio investment and banking inflows from Mainland China, Venezuela, and Brazil, on a nationality basis (albeit subject to very high levels of uncertainty, particularly in the case of Venezuela).

Finally, the UAE shows a pattern of IFF and IFS risks that are estimated to be concentrated in trade and FDI respectively, while being quite diverse geographically (keeping in mind the limitations of UAE data availability discussed earlier). While Mainland China and Russia are estimated to be the two largest sources of IFF risks, by both proximate geography and actor nationality, these two countries account for less than one quarter of total estimated UAE IFF risks. The remainder of UAE IFF risks are mostly estimated to originate from a number of countries across the Middle East, Africa, and South Asia (most importantly Iraq, Iran, India, Libya, Sudan, and India). Similarly, while Russia is estimated to be the largest source of IFS risks for the UAE on both a proximate geographic and actor nationality basis—mostly via Russian FDI round-tripping through the UAE (see Haberly and Lawrie 2026)—it still accounts for less than one fifth of the UAE's total estimated IFS risk. As for IFFs, the remainder of UAE IFS risk is attributed to actors from a diverse mixture of countries including Iran, Lebanon, India, Mainland China, Sudan, Saudi Arabia, Iraq, and Italy. In addition to impacting the UAE directly from actor home countries, a substantial portion of these risks are estimated to be intermediated indirectly through offshore and other international financial centers—with the United States and Cayman Islands estimated to be key intermediaries for portfolio investment-linked risks, and Switzerland and the UK estimated to intermediate the bulk of banking sector-linked risks.

5. Conclusion.

It should be stressed that the methodology here does not seek to directly estimate either illicit financial flows or stocks. Rather, the goal is to try to infer, as comprehensively as possible, the basic scale and geometry of the non-tax-related illicit financial risk envelopes for various countries, by applying reasonable sets of assumptions to the best currently available data. This risk envelope estimation approach, crucially, seeks to to circumvent basic empirical limitations on our ability to either directly observe non-tax-related illicit financial flows and stocks at comprehensive level—which by definition tend to largely arise in or pass through countries with very poor quality data—or to effectively disentangle stock and flows, to the extent that they can be observed, from typically much larger tax-related and other commercial financial and trading anomalies.

At the core of the methodology here, as well as the key patterns that it reveals, is the finding that non-tax-related illicit financial risks appear to vary across countries according to highly non-linear exponential risk functions. Most important, in this respect, is actor home country institutional and political risk (i.e. rule of law)—with the illicit financial risk attached to a given unit of trade or investment estimated to be hundreds of times higher for actors from countries with low rule of law, as compared to actors from countries with relatively high rule of law. Also estimated to be extremely important, however, is proximate jurisdiction-level regulatory (secrecy) risk, which appears to vary over roughly an order of magnitude between more secretive as opposed to transparent jurisdictions.

As shown in the analysis here, this more than thousand-fold total combined variation in the estimated *relative* intensity of non-tax illicit financial risks, between various combinations of actor home country and host/intermediary jurisdictions, imposes relatively tight constraints on the maximum allowable illicit portion of funds for relatively low-risk actor nationality and jurisdiction combinations. This in-turn yields relatively conservative non-tax illicit financial flow and stock risk envelope estimates, even when sensitivity analysis is applied to account for uncertainty in the overall shape/slope of the relative risk functions. It also means that countries with particularly high levels of political and institutional risk, such as, for example, Venezuela, Russia, or Iran, can generate a share of total illicit financial risks (at the global or bilateral international level) that is enormously out of proportion to their broader economic importance.

Several findings from the results here have particularly important implications for efforts to understand and measure as well as combat illicit financial activities. Firstly, with respect to IFF measurement, the non-tax IFF risk envelopes estimated here, for major economies, are remarkably well-aligned with prior IFF estimates derived using completely different trade and balance of payments anomaly detection methodologies (e.g. Kar and Spanjers 2015; see discussion in section 4). However, it is also striking that the maximum IFF risk envelope values estimated here, even in the most aggressive sensitivity analysis scenarios, tend be slightly lower than these previously estimated IFF values, even when the latter (as in the e.g. Kar and Spanjers 2015) are based on data a decade or more older than that analyzed here. This has two potential implications, which are not necessarily mutually exclusive. Firstly, it suggests that the actual global incidence of non-tax-related illicit financial activity may be close to the theoretical maximum possible value that is allowable within the constraints of the empirically calibrated risk intensity function here—with the implication being, notably, that the *very* highest-risk trade and investment pathways in the world economy (as defined by the intersection of national institutional, political and regulatory environments) may in practice consist largely or even primarily of illicit activities. Secondly, however, it also suggests that non-tax-related illicit financial risks (as linked to, e.g., total

potential flows of "money laundering") may be somewhat lower, in general, than estimates of total IFFs as gauged through trade and balance of payments anomaly-detection-based methods. This finding, in fact, dovetails with conceptual expectations, due to the inability of the latter methods to clearly distinguish between tax and non-tax-related anomalies on the one hand, and honest as opposed to dishonest discrepancies in underlying data on the other (as described by e.g. Brandt, 2023; Collin, 2020; Forstater, 2018).

Importantly, the analysis here does suggest that trade anomaly-based IFF estimation—as for example undertaken through mirror-data-based trade mis-invoicing analysis—can provide an effective first-order approximation of overall IFFs for most developing countries, which generally appear to be heavily dominated by trade-related flow risks. Indeed, the 84% estimated contribution of trade to developing country IFF risks derived from the analysis here is almost identical to the 83% estimate in Kar and Spanjers (2015). However, the results here show that this pattern does not hold for developed countries, where IFF risks are often more heavily concentrated in banking and other international financial channels. Furthermore, and more importantly, the distribution of illicit financial *flow* risks appears to be only weakly related to illicit financial *stock* risks. To put this differently, the proceeds of historical illicit activities do not accrue in any sort of linear or consistent manner from a given volume of cumulative illicit flows. Both the scale and geography of this accumulation are rather conditioned by a host of complex factors (e.g. the extent of savings of illicit proceeds versus their consumption or reinvestment in further illicit activity, distribution of asset markets, rates of returns on already-invested illicit financial stocks, etc.). The implication of this is that the estimation of illicit financial *flows,* whether through trade-based or other channels, is not, in and of itself, an effective or sufficient means for assessing global illicit financial risks in general—including, for example, within the context of efforts at asset targeting and recovery. The distribution of accumulated illicit financial proceeds rather needs to be problematized as an analytically distinct exercise.

Meanwhile, from the standpoint of policy, by far the most important implication of the analysis here is that financial secrecy matters a great deal for non-tax illicit financial risks, which are estimated to be more than an order of magnitude higher (in relation to total trade and investment) in the most as opposed to least secretive jurisdictions. Crucially, in this respect, as shown in Haberly, Gullo, Shipley, Boukal, Palansky and Barrington (2024), there is a growing geographic (and statistical) disconnect between the international landscape of AML/CFT compliance, which has traditionally been prioritized in relation to non-tax IFFs, and the types of infrastructural financial transparency—in areas such as, for example, beneficial ownership reporting, statutory banking secrecy, and international information exchange—which the analysis here suggests are actually most important in relation to IFF risk. Particularly important, in this respect, is the fact that many offshore jurisdictions, and

in particular the British Overseas Territories and Crown Dependencies, appear to have largely converged (or in some cases even overtaken) many OECD economies with respect to AML/CFT compliance, but at the same time often continue to systematically lag in the implementation of broader financial transparency reforms. The analysis here suggests that the latter delays are likely resulting in the continued concentration of large-scale illicit financial risks in the British Overseas Territories, in particular, which are estimated to play a central role in the illicit financial risk profiles of some countries including the United States. At the same time, however, the analysis underscores the need for corresponding transparency reforms in some of the world's largest economies. This is particularly important in the world's two largest economies, the United States and China, where persistently low levels of financial transparency (e.g. in relation to beneficial ownership reporting) are estimated here to substantially amplify national illicit financial risks—both from the standpoint of the US and China themselves, and from the standpoint of their impact on other countries.

One particularly important area for further improvement in existing financial transparency frameworks, highlighted by the analysis here, is the treatment of portfolio investment, and investment funds generally (including e.g. private equity). Indeed, the analysis suggests that the composition of illicit financial stock risks for a number of countries, including the United States and some developing economies, may be largely dominated by risks mediated through the channel of portfolio investment, particularly via offshore jurisdictions (e.g. the Cayman Islands for the US). From the standpoint of national tax authorities in participating countries, international automatic exchange of information (AEOI) agreements (e.g. OECD CRS) should in theory largely cover the use of such facilities by nationals. However, the analysis here suggests that portfolio investment may also be a leading channel for the international investment of the proceeds of illicit activity from many high-risk developing countries (e.g. Venezuela), which is unlikely to be effectively covered by frameworks such as CRS. Notably, there are also many cases in which investment funds (particularly private equity and hedge funds) appear to function, in effect, as de-facto institutional analogs for private investment trusts or family/multi-family offices, rather than playing the typically assumed investment fund role of pooling together capital from disparate arms-length sources (see Haberly and Lawrie 2026). From this standpoint, it may make sense to apply the same type of threshold-based (e.g. >25%) ultimate beneficiary public reporting requirements as companies (e.g. as required in e.g. the UK). Additional portfolio investment-specific transparency guidelines, such as, for example, the publication of aggregated (i.e. anonymized) breakdowns of the nationality of ultimate fund beneficiaries, in the case of widely held funds, would also greatly facilitate the international tracking of illicit financial risks.

Indeed, what is in many respects just as important to this effective tracking of illicit financial risks as micro-level beneficial ownership reporting, is the publication of high-quality official statistics on international investment and trading flows and positions. By far the largest and most problematic gaps in this data at present are found in the British Overseas Territories and Crown Dependencies, which together intermediate at least $11 trillion of FDI and portfolio investment, or roughly 11% of all such investment worldwide (based on available 2023 IMF CDIS and CPIS data). Currently, this represents a virtual data black hole at the heart of the global financial system—with no British Overseas Territory or Crown Dependency reporting any data at all to the IMF on bilateral FDI, while only Bermuda, the Cayman Islands, Gibraltar, Guernsey and Jersey report data on bilateral portfolio investment (solely in the outward direction). These international investment positions rather need to be reconstructed based on mirror data reported by counterparties, which is crucially nonexistent for the highest risk illicit financial source countries identified here such as Russia, Iran or Venezuela. For the present study, we have attempted to reconstruct this missing data as effectively as is currently possible, via the tracing of international investment chains used to hold assets in countries with higher quality data. However, the resulting estimates are characterized by inherently high levels of uncertainty (see Haberly and Lawrie 2026), which are further amplified by the second-order inferences drawn here from FDI network structure in relation other investment and trading flows.

What is most needed not only for British Overseas Territories and Crown Dependencies, but for economies generally, is more consistently available and higher-quality data on the ultimate as opposed to only proximate origins and destinations of international investment. While several major economies have begun to collect and publish this data for FDI and (consolidated) banking positions, this data remains unavailable for most developing countries (as well as some major developed countries such as the UK), absent the type of ground-up micro-data-based reconstruction employed here. Moreover, the level of ultimate investor nationality in official statistics (in contrast to the data constructed here) is itself usually defined at a relatively superficial level of parent-entity registration (often offshore), rather than on a substantial nationality basis (see Haberly 2024; Haberly and Lawrie 2026). Just as importantly, no official dataset (in contrast to the dataset constructed here) presents data on foreign investment, much less on trade, which is cross-disaggregated on both an immediate and an ultimate investing country basis—thus showing the full pathways through which money moves internationally. What this means is that we have at best a fragmentary picture of where illicit financial risks are ultimately originating from the standpoint of particular countries, as well as the channels through which these risks are likely to be entering these countries.

The biggest blind spot in currently available data, from the standpoint of illicit financial flow estimation, surrounds the structure and scale of bilateral international banking transactions, as opposed to simply outstanding bilateral international bank asset and liability stocks (as currently reported by e.g. the BIS). As shown in the analysis here, a counterintuitive consequence of this gap in international banking data is that the potential scale of IFFs is actually more uncertain for *developed* countries than for developing countries, due to the much larger role of the banking sector in the illicit financial risk profiles of the former. The resulting uncertainties are especially pronounced for the UK, due to its role as a key international banking node, for which our upper and lower total IFF risk envelope estimates differ by nearly a factor of 4 (far more than for any other country). Notably, much of this missing data on the scale of international banking flows should in theory be held by organizations such as SWIFT, but is not made currently available at a level that would support even aggregated bilateral international IFF risk assessment.

Ultimately, it is a critical matter of both public interest, and the complementary national interests of multiple countries, to close these gaps in international financial transparency and data availability, at a micro- (e.g. beneficial ownership) as well as macro-level (e.g. international investment data). Indeed, while methodological progress continues to be made in efforts to find the needle of illicit financial flows and assets in the haystack of the global economy, and thus support the effective targeting of these flows through improved policy and enforcement, such efforts are likely to meet with limited success if we cannot see the haystack itself.

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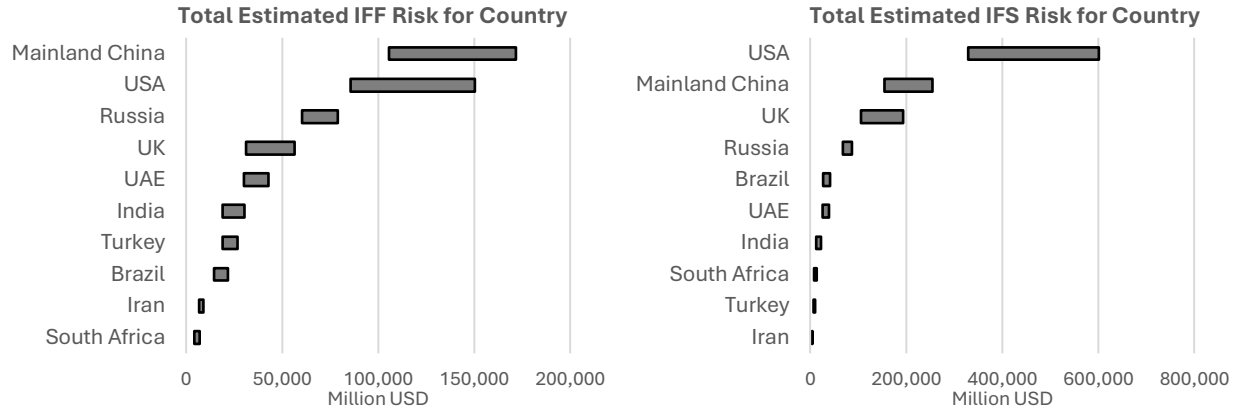
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Appendix A: Sensitivity analysis results

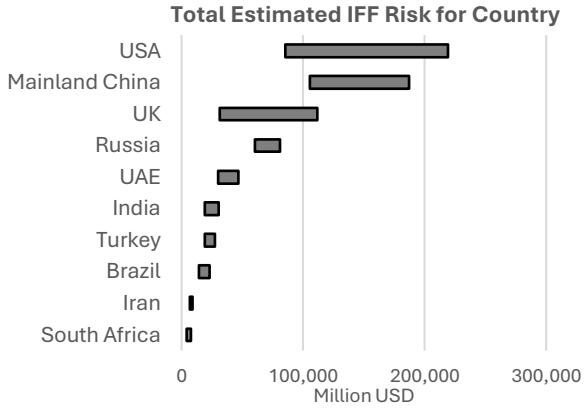
A1. Impact on total illicit financial flow (IFF) and illicit financial stock (IFS) risk envelopes of changing actor home country rule of law risk function sensitivity



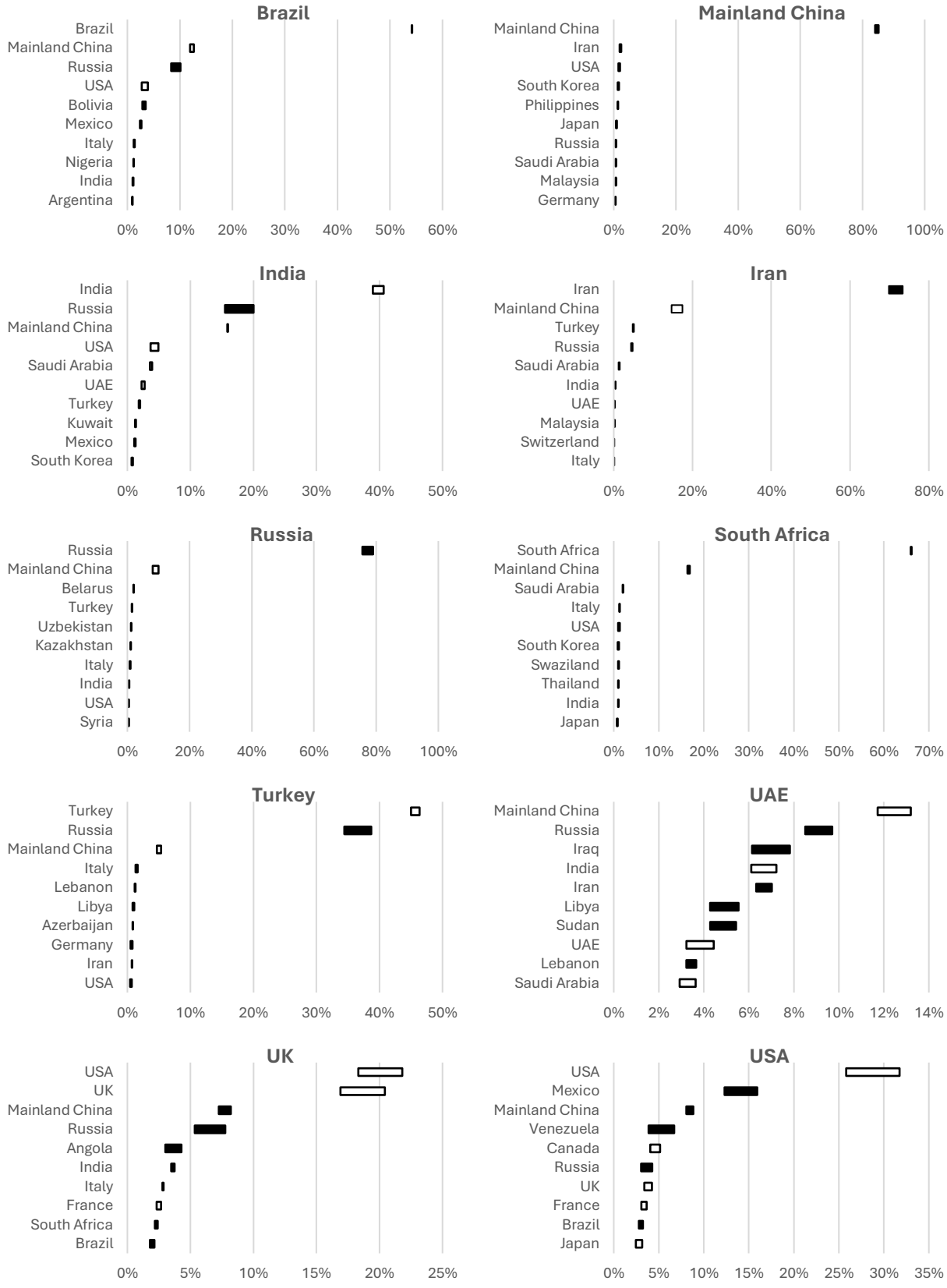
A2. Impact on total illicit financial flow (IFF) risk envelopes of changing non-interbank deposit turnover rate and home country rule of law risk function sensitivity



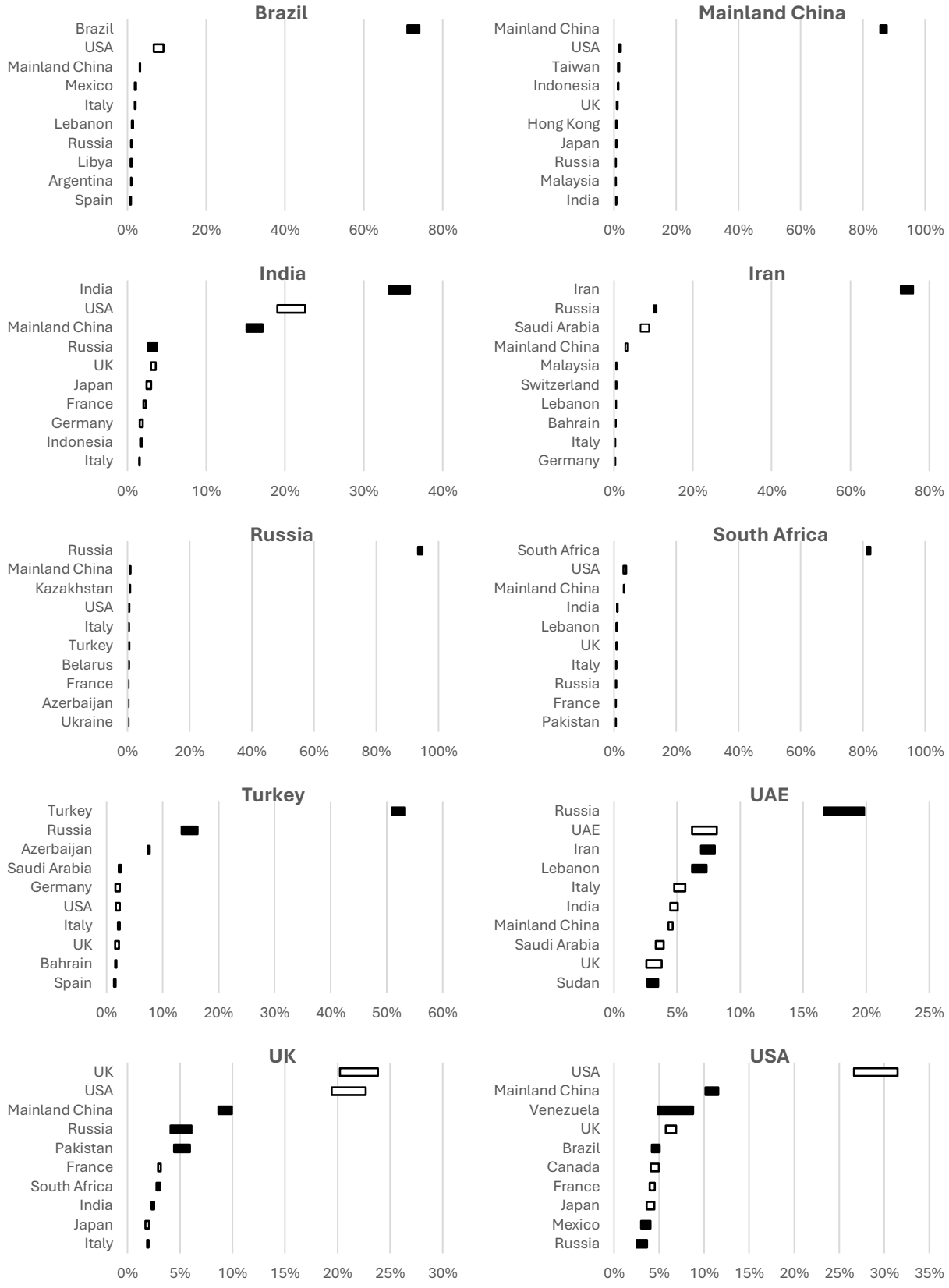
A3. Combined impact of non-interbank deposit turnover rate and home country rule of law risk function sensitivity on total IFF risk envelopes



A4. Increased (white) & decreased (black) actor nat. IFF risk shares with lower rule of law sensitivity



A5. Increased (white) & decreased (black) actor nat. IFS risk shares with lower rule of law sensitivity



A6. Increased (white) & decreased (black) proximate IFF risk shares with higher bank deposit turnover

